

# **CRAFTS FOR BASIC SCHOOLS**

## **Utilising Waste Material**

**NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING  
NATIONAL INSTITUTE OF BASIC EDUCATION**

**41-A, Friends Colony  
New Delhi-14**



# CONTENTS

	PAGE
<i>lets</i>	
PREFACE . . . . .	(i)
ABOUT THIS BOOK . . . . .	1
SUGGESTIONS TO THE TEACHERS . . . . .	3
ARTICLES :	
Card-Board and Paper work . . . . .	4
1 Paper cap . . . . .	
2 Papier mache—method I . . . . .	
3. Papier mache—method II A and II B . . . . .	
4. Papier mache—method III . . . . .	
5. Marble paper making . . . . .	
6. Railway-train . . . . .	
7 Album . . . . .	
8 Wind-mill . . . . .	
Use of Coconut Shells . . . . .	12
9. Pen-stand . . . . .	
10. Flower-vase (coconut-shell) . . . . .	
11. Device to take out water . . . . .	
12. 'Agarbatti' Stand . . . . .	
Use of Scrap wood and bamboo . . . . .	16
13. Device for Drying Clothes . . . . .	
14. Coat Rack . . . . .	
15. Balance . . . . .	
16. Simple Balance . . . . .	
17. Book Rack . . . . .	
18. Catapult (Gulail) . . . . .	
19. Coat Hanger . . . . .	
20. Blotter . . . . .	
21. Use of Waste Bamboo . . . . .	
22. Pair of Stilts . . . . .	
23. Bamboo Box . . . . .	
24. Electric-stand . . . . .	
25. Takli Box . . . . .	
26. Walking Stick . . . . .	
Use of Leather scraps, egg shells and straws . . . . .	29
27. Use of Leather Scraps . . . . .	
28. Slippers . . . . .	
29. Pump Washer . . . . .	
30. Sewing Machine Belt . . . . .	
Use of Metal waste . . . . .	31
31. Blotter . . . . .	
32. Ice Container . . . . .	
33. Razor-blade Pen-knife . . . . .	
34. Pin Cushion . . . . .	
35. Letter Holding wire . . . . .	
36. Contrivance for G-Wire Door Mats . . . . .	
37. Spring Door Mat Making . . . . .	
38. Coat Hanger . . . . .	
39. Shell Tree . . . . .	

<b>Glass and China</b> . . . . .	39
41. Drilling Holes in Glass	
42. Making Glass Containers	
43. Cementing Broken China and Glass ware	

**Miscellaneous**

44. Garlands
45. Batik Work
46. Felt Bag
47. Use of Tin Foils
48. Kathari (Quilt)
49. Link Belt
50. 'Shegadi'
51. Shoulder Bag
52. Food Cover
53. Flower Vase (tin)
54. Feathers Fan
55. Brush Making
56. Brush for Clothes
57. Rubber Scrap
58. Whistle
59. Skipping Rope
60. Fruit Plate
61. Ladies Hand Bag from Sponge Gourd
62. Cement Paper Weight
63. Polish and Polishing
64. Aloe Stem as Cloth Hanger or Hat Stand
65. Paper Tree
66. Leaf Impression
67. Making of Ink
68. Nature Craft
69. Bel Fruit Tobacco Box

<b>Art and Artistic Articles</b> . . . . .	64
--	----

70. Flower Picture
71. Walking Man
72. Bird
73. Giraff
74. Sceneries
75. Tailor's Cutting Pictures
76. Coloured Paper Mosaics
77. Bamboo and Egg Doll
78. Paper Horse
79. Paper Bag Doll
80. Paper Doll
81. Dog
82. Fancy Doll
83. Horse
84. Wooden Doll
85. Baby Doll
86. Straw Doll
87. Wire Sculpture
88. Bird
89. Paper and Cloth Pictures
90. String and Cord Pictures
91. Spool Toy
92. Mosaic Pictures
93. Sun Flower
94. Picture out of Groundnut Shells

**Appendix**

A. A tentative syllabus . . . . .	83
B. A tentative list of articles that can be made out of waste materials . .	89
C. Minimum tools required . . . . .	92
D. A selected bibliography . . . . .	93

## PREFACE

Some experimental work on simple and new crafts which would be conveniently adopted as creative and educative crafts in Basic and non-Basic schools was started in National Institute of Basic Education. The results of experimental work initiated thus are being put forth in the form of several publications such as '*Fibre Craft*', '*Elementary Bamboo Work*' and '*Elementary Doll Making*' in a series entitled 'Crafts for Basic schools'. The present publication '*Utilising Waste Material*' in the same series describes a number of articles which can be prepared out of waste material.

It is hoped that this book will stimulate a variety of crafts activities in our schools and encourage school children and teachers to explore their environment for possible collection of waste material for useful purposes.

J. K. SHUKLA

*Director*

NATIONAL INSTITUTE OF BASIC EDUCATION,  
New Delhi-14



## *CHAPTER I*

### **ABOUT THIS BOOK**

The value of craft work in education has now been immensely recognised. As a result of which we find to-day almost all the countries of the world have craft work in some form or the other in their systems of education. It is mostly in the primary stage that it is universally accepted. In our country we do not have craft work in the primary stage for vocational training. Crafts, in Basic education, are a potential media of education, and have become quite indispensable factors of this system of education.

Recently, however, a doubt has been expressed that as the usual Basic crafts of spinning and weaving, gardening and agriculture and card-board work and carpentry have their own extraneous limitations owing to finance, space, material and personnel, whether some of the crafts are combinations of crafts equally educational but less effected by above mentioned factors of limitations, can be introduced. There is also another point for consideration and that is whether some variety of crafts or of crafts work could be provided to the child in the place of a single craft keeping, of course, in view the above mentioned limiting factors. This is suggested not with the intention of enabling the teacher to assess the child's aptitude but to minimise the alleged monotony of one and only one craft and to stimulate interest every time the child took to **craft work**.

Publication of this book is an answer to it. This has been possible because of observation of different Basic schools at work and consultation with persons in the field.

This book deals with handicrafts and craft work of varied types. Its speciality, however, is not in providing variety but in maintaining interest throughout, in being education and in not being effected by the above mentioned limiting factors.

As regards space, apart from some space for storage etc., this work does not require more than the usual normal class-room accommodation. With regards to other factors—availability and cost of material—the question does not arise at all. Having solved these three major difficulties, the only one which remains is with regard to the teacher. Whatever the academic and professional qualifications of the Basic school teacher be, the most important requirement is an aptitude for craft work combined with constructive imagination for imparting education. No special training for this type of work is envisaged. Experience should be his natural source of learning. This book provides the necessary guidance required for introducing a work of this type.

This type of craft work also provides many varieties to cater to the varied interests of the class and hence the alleged routine monotony is not to be experienced. However, some criticism has to be anticipated. It may be argued that this work may not have that speed or

continuity of craft work afforded by the regular Basic crafts. This is answered in two ways. Firstly, this is not a full-fledged craft; secondly, it spreads over the first four grades and within this range it is its gradual continuity and increasing potentiality. Moreover, it is not in any sense, limited either to the contents dealt herewith or to the method in which they are to be produced. Keeping clearly in mind the educational point of view, it can be expanded and developed quantitatively and qualitatively. The book is intended only to give a new direction to a set type of outlook.

This orientation is felt more necessary at this time when a majority of traditional type of primary schools is to be geared with the Basic pattern through the present orientation programme in action. This new development has to face certain problems. Introduction of crafts and arts is one of them. This book tries to answer the same to certain extent.

Recently it has been remarked that the craft work does not provide opportunities for the development of creative and artistic urge. Craft work is not to be bifurcated from art work. The appealing capacity of any piece of craft work lies in the artistic imagination for designing and finishing. Craft and art are truly complimentary in their function at least at the school level. The series of articles described in this book is a testimony of this view. There is an art of crafts.

A number of useful and artistic articles can be easily prepared from these materials of different types of fibres. Fibres, having been dealt separately in a booklet named 'Fibre Craft' published by the National Institute of Basic Education, have not been included in this publication.



## CHAPTER II

### SUGGESTIONS TO THE TEACHERS

Whatever suggestions given here, unless the teachers think independently in the broader contents of education of their children and of the different limitations imposed on craft work, no success could be achieved with any plan or work of plan. The following are a few suggestions only to facilitate their work.

1. Work has to be planned well ahead in consultation with the headmaster and his colleagues.

2. Prior practice by the teachers is essential before demonstration to the children.

3. In the production of articles, the need of the child, his home and school should be given the primary importance.

4. Visits to workshops of craftsmen be arranged for budding craftsmen. The village craftsmen may be invited to schools also for demonstration of certain processes or for the appreciation of work done by children.

5. A good craft worker does not believe in wasting any piece of material even if it is of no value. There is nothing what is waste. Only a new use is to be found. Making useful and beautiful is the joy of a skilled and intelligent workman. This is a little challenge to accept. This means exercising constructive imagination, ability to design, capacity to construct or re-construct and instilling aesthetic beauty.

6. Fundamentals may, of course, be learnt first and skills be developed by practice

7. Progress is visualised only when fewer mistakes are made on every succeeding occasion and the previous mistakes are not repeated.

8. Teachers should always welcome and be alerted to new environments; new materials; new techniques; and new tools and methods.

9. It is not only the project that matters but its complete exploration for educative purposes.

## CHAPTER III

### ARTICLES

#### CARD-BOARD AND PAPER WORK

##### 1. Paper Cap

Children love to make a lot of things out of paper. They enjoy making of paper caps if they can do so. It is easy to make a cap and the materials required are very cheap.

*Materials required :*

1. Brown paper or drawing paper or any used newspaper. (The size depending upon the size of the cap required).

2. Cloth.

*Method :*

1. Take a piece of paper ABCD—a foolscap—measuring  $17" \times 13\frac{1}{2}"$  as shown in Figure 1. EF is a line 2 inches from AB. GH is another line 2 inches from EF. KL and IJ are similar lines on the other side. MN is equidistant from GH and IJ. OP are two points  $4\frac{1}{2}"$  from M and N. QR and ST are lines at a distance of 2 inches from the edges.

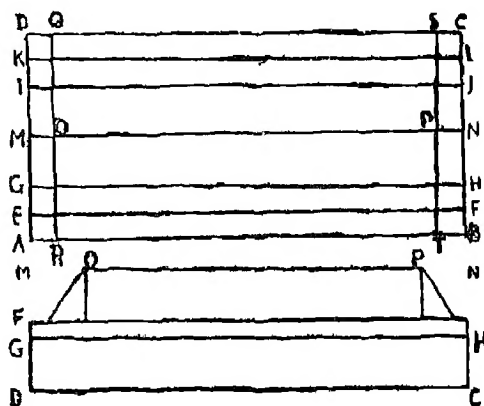


Fig. 2

2. After marking the paper folding work is done. Paper is folded on EF so that AB falls upon GH. It is folded again similarly on GH. Again it is folded in the opposite direction on MN. Then a fold is given on OG so that M falls on GH. Similar fold is given on HP. The triangles so formed are placed below the fold on GH. The result of the folds will convert the paper into a new shape given in Figure 2.

3. Now turn the up-side down with the edge CD towards oneself. The half of one side is folded on the line ST. The other side is folded on QR. The next fold is given on IJ and the last on KL. The cap is thus ready for use.

4. A little bit of design work on it will add to its aesthetic beauty.

## 2. Papier Mache—Method I

In papier mache we have almost an ideal child activity. It costs practically nothing in materials, and it is sufficiently easy to appeal a child while at the same time it requires a certain amount of patience and accuracy. The finished products are both useful and attractive and usually find a ready market. We may, however, start with simple to complex articles, for instance, bowls, ash and pin trays, plates, saucers, cups, tea-trays and basins.

### *Materials required :*

1. Waste paper or used newspapers, etc.
2. Paste of flour (Maida)
3. Moulds.
4. Brushes.
5. Sand-paper.
6. Paints.
7. Water basin.
8. Some oil or vaseline.

### *Method .*

**1st Stage**—In this stage waste paper is torn into pieces roughly about an inch in breadth and then soaked in water for an hour or so in a water basin. When properly soaked they are taken out in small handfuls, keeping the pieces flat and then squeezing out the surplus water between two palms. They are then placed in a damp cloth to prevent them from drying.

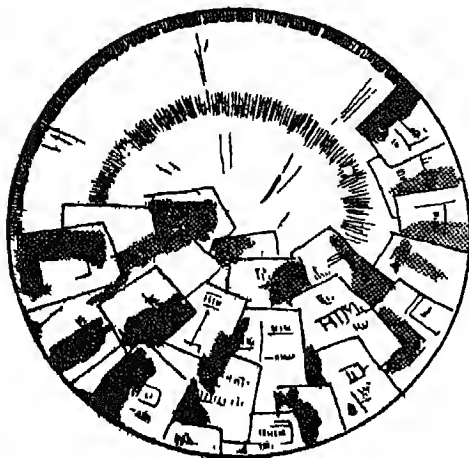


Fig 3

**2nd Stage**—The mould of the article to be prepared is then taken (in this case a plate). The inside surface is slightly greased with vaseline or oil. Small pieces of damp paper are separated carefully and layer of paper is placed all over the inside of the bowl, letting the edges overlap as little as possible as shown in Figure 3, till the whole of the inside of the plate is covered.

With the two figures the paste is smeared all over the first layer of paper with a gentle pressure. Brush should not be used as it is apt to dislodge some of the pieces. Paper is pressed well into shape over the rim of the plate. It does not matter if it is

rough at the edge as this will be trimmed up at the end. Another layer of paper is put all over the first one, and smeared again with paste. This is to be repeated till there are 8 to 10 layers of paper and then the last layer should be pasted.

To make sure that the whole surface is covered each time, it is well to keep the printing on the paper of the right way up in one layer, and up-side down in the next, or apply one colour of paste once and of the second colour thereafter.

In working care should be taken that no drops of water or blots of paste are left as they would create hollows when dry.

*3rd Stage*—When dry the papier mache article should be firm and solid enough to slip out of the mould. The outer surface will be found to have corners of paper which have overlapped, and are not stuck down properly. They are to be pasted into position. The surface of its interior as well as exterior should be smeared with paste for strengthening it.

*4th Stage*—When thoroughly dried edges should be trimmed with a pair of scissors and the whole surface be smoothened with sand-paper.

*5th Stage*—In the last stage it should be painted with enamel or ordinary colours and decorated and designed according to our needs. Paint shall make the plate waterproof besides decorating and strengthening.

In case enamel paint is not available its surfaces can be decorated with the process of marbling (the process of marbling is described elsewhere in this book), or with the following recipes :

1. Some ash of rags.
2. Linseed oil.

Paste be prepared of these two ingredients and applied on both the surfaces of the plate.

### **3. Papier Mache—Methods II A and II B**

#### *Method II A*

*Pulp method* : Papier mache articles can be made with paper pulp also. For professional work this is considered to be the most economical and the easiest method.

*Materials required* :

1. Waste paper.
2. Grinding stone.
3. Slab with a circular pestle or stone pestle and mortar.

*Making of paper pulp* : Paper is torn into small pieces to soak it in water for about a week. Pieces are then taken out to convert

them into pulp by grinding against hard stone slab with a circular pestle. It can also be done with a stone pestle and mortar. During the process of making pulp it is necessary to add water when required till all pieces are reduced to fine pulp.

### *Method II B*

#### *Materials required :*

1. Waste paper (5 seers).
2. Lime (1 seer).
3. Earthen pot.
4. Water.
5. Stove.
6. Fuel.
7. Multani clay (mitti).
8. Grease (Vaseline or oil).

*1st Stage*—Five seers of paper cutting are taken and boiled in earthen pot for about four hours in sufficient quantity of water, adding one seer of lime.

*2nd Stage*—The pieces are then removed and washed well several times till there is no trace of lime.

*3rd Stage*—Then these pieces are to be ground well to reduce into fine pulp. This method reduces paper pieces into pulp in a lesser time

*4th Stage*—Having obtained pulp, it is now necessary to mix it with 25% of Multani mitti to make a mixture for work.

*5th Stage*—This mixture is to be pressed against a mould to obtain the desired shape.

A little grease should be applied to the mould before the pulp is pressed.

Broken earthen toys, pots and other suitable articles may be utilised to serve as moulds.

## **4. Papier Mache—Method III**

Papier mache work is carried on in many ways. The huge masks seen in plays are often made of papier mache built over some sort of frame-work besides the work over the moulds described in previous experiments.

#### *Materials required :*

1. Waste paper.
2. Paste.

3. Water.
4. Basin.
5. Salt.
6. Sand-paper.
7. Decoration materials.

*Method :*

*1st step*—Tear off waste paper into small pieces.

*2nd step*—Soak these pieces of paper in water for about 24 hours. The smaller the pieces, the finer the papier mache work will be.

*3rd step*—Soaked paper will be ready for pulp as indicated in the previous experiment.

*4th step*—Paste of flour (maida) should be added to make the mixture thick and stiky in the proportion of :—

Paper	.. . . .	3 cups
Paste	. . . . .	1 cup
Salt	. . . . .	$\frac{1}{2}$ cup

Adjustments in quantity may, however, be made in this proportion according to the requirements of the size of the object to be made.

*5th step*—This mixture, thus prepared be moulded like clay and shapes of animals, birds, lamp-shades, trays, bowels etc., be tried according to requirements.

*6th step*—The finished article be kept for thorough drying.

In case a larger figure is needed, the pulp should be moulded round a frame made of G wire (Galvanised Wire).

*7th step*—After the article is dry that may be smoothened with sand-paper and finished in painting and design work or marbling to give an attractive appearance to the article.

### 5. Marble Paper making (Abri or Coloured Paper)

Children in schools make a number of articles from waste paper in papier mache or paper pulp but find it difficult to decorate them. The easiest process for them to decorate their articles may be in the process of marbling. Its results are always remarkable.

*Materials required :*

1. Papier mache tea-tray.
2. Dyeing colours—blue, yellow, red and green.
3. Brushes of  $\frac{1}{2}$ ".
4. Comb or piece of card-board.

5. Scissors.
6. Plates (four).
7. Paste.
8. Tub.
9. Paper weight or round piece of stone.

*Method :*

*1st Stage :* Put some paste in all the four dishes and add different colours in them. Mix them with brushes and keep them for use.

*2nd Stage :* Take one colour and apply it on the tray with the brush. With the help of comb make zig-zag or some other designs on its surface. In the same way apply the other colour where necessary and prepare some design with the help of the comb and repeat the process with the other colours till the both surfaces of the tray have been decorated. This may now be allowed to dry.

*3rd Stage :* The Marbled tray is then glazed with a paper weight or a round piece of stone.

NOTE.—With some practice beautiful designs of natural scenery could also be obtained by using a used tooth-brush. This process can be conveniently utilised to make marble paper to be used in book-binding or book-covers.

## 6. Railway Train

It may be seen that a number of articles of educative value could be prepared with empty cigarette boxes with a little imagination on the part of the teacher, for example, railway trains, steamers, boats, wall decorations and geometrical designs, etc., etc. Toy trains are always a favourite with children. Therefore, the best thing would be to make them in schools or at home. All you need are empty cigarette packets which can be easily collected from 'betel' shops or from some smokers.

*Materials required :*

1. Empty cigarette packets.
2. Flour paste.
3. Some white paper.
4. Pair of scissors.
5. Some colouring and designing materials.

*Method :* Two packets are placed side-by-side standing on their longer sides as shown in Figure 4.

Strips of paper are pasted to hold them securely. (Figure 5).

**1st Stage :** One pair will serve for one coach. Strips on neatly cut white paper just of the width of two packets, which have already been secured and,  $\frac{1}{2}$ " longer than their length are cut.

**2nd Stage :** These are coloured in dark gray to represent the roof of the train and pasted on the packets and extra portion is pressed down on the sides. Similarly, some strips are coloured red and doors, windows and wheels are drawn on them with black ink. They are then pasted at appropriate places at the carriage. A coach is now ready which can be seen in Figure 7.

Fig. 4



Fig. 5

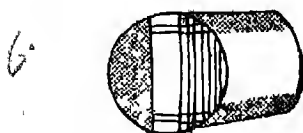
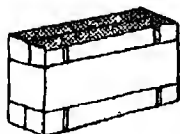


Fig. 6

**3rd Stage :** In this way, more carriages may be prepared. Now couplings are to be provided to join the coaches. These can be provided by fixing a wire loop at one end and hook at the other end to each coach. This can couple or uncouple coaches easily.

There cannot be a railway train without train-engine. We have, therefore, to satisfy that we have provided with a railway engine

too. For this purpose two pasted packets are taken as basis. A piece of thick brown paper is folded in round shape and pasted over the packets. (See Figure 6).

A brown paper should be coloured black. It is better to make five to six coaches and one engine. To make the train sliding it is advisable to add 4 wheels to each coach. The wheels could be cut out of thick card-board using bamboo sticks as axles.

### Teaching Aids out of Collections from Newspapers and Magazines, etc.

Collections of cuttings from newspapers, magazines and illustrated weeklies provide innumerable teaching aids. They contain pictures and photographs of eminent personalities of India and abroad, sceneries of landscapes, pictures of animals and birds and reptiles of India, photographs of men and women of different nations and their inhabitants in costumes, etc., and many other things. A child may be encouraged to cut a series of collections, say—pictures of eminent people of India and abroad. Another child collects pictures of landscapes, and the third collects pictures of animals and birds and so on. These pictures should be pasted in an album which can be used as a teaching aid. The child derives a great joy out of his collections. This encourages observation and develops finger-skills.



## 7. Album

*Materials required :*

1. Wrapping paper.
2. Drawing paper.
3. Newspapers.
- 4 Old illustrated weeklies and magazines.
5. Pair of scissors.
6. Thread.
7. Needle.
8. Paste.

*Method :*

*1st Stage :* Out of the above collection a thick piece of paper is selected for the cover of the album. About 24 pieces of newspapers are cut to the size of cover and a book is stuck to be used as an album. An old drawing paper book can also serve the purpose as an album. Let us have about six of these for six types of series of collections, say—(1) People of different nations—their costumes, etc. (2) Landscapes, sea-scapes, snow-scapes and other scenery. (3) Birds, animals and reptiles. (4) Personalities of India and abroad. (5) Festivals and temples in India. (6) Adventurers, discoverers, inventors and scientists, etc.

The above series are so selected that collections could be easily obtained from dailies, weeklies and illustrated magazines. It is possible in many cases to make arrangements with the regular subscribers for free gifts.

*2nd Stage :* Children may be asked to cut out pictures with the aid of scissors, keeping the headline intact and to paste these pictures in the album systematically. After a year's regular attempt a permanent record for teaching aids will be developed. It may be added that many times accounts of festivals, speeches of prominent people on various subjects having educative value appear in local papers. A separate album could be maintained as a permanent record for further references.

The child likes pictures. It is through pictures more than anything else that he is drawn into the fold of education. An album will enable him to cultivate his power of observation and selection and will teach him how to preserve things of importance.

## 8. Wind-Mill

Children like wind-mills rotating with the slightest whiff of the wind.

Paper wind-mills made by some of the professional toy makers cost more and do not give too much a pleasure. If the same is made by

the child himself that may prove a source of joy for him. It is quite easy to make the same at home.

*Materials required :*

(1) Some bright coloured stiff paper. (2) A bamboo stick or a piece of reed of 3" length and  $\frac{1}{4}$ " diameter. (3) Pair of scissors.

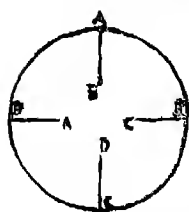


Fig. 8

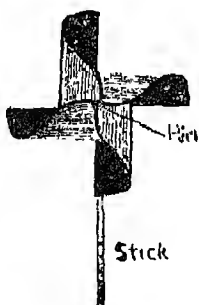


Fig. 9

*Method :*

*1st Stage :* Cut a circle with radius of 5" to 10" in diameter.

*2nd Stage :* Cut the circle so prepared at 4 equal distances in the circular paper as shown in figure 8.

The cutting should begin at the circumference and come to as far as half an inch from the centre.

*3rd Stage :* Fold at the sections in such a way that A at the circum-

ference overlaps with A at the centre, B with B and so on till all the four sections have been folded.

*4th Stage :* A strong pointed pin is inserted through all the folded sections at the centre and its pointed tip inserted into the head of a thin bamboo or a piece of reed stick as shown in Fig. 9.

Thus the wind-mill will be ready which usually rotates fast and merrily.

This wind-mill becomes an aid for the child to learn about force and direction of wind from time to time. Periodic observation and graphical presentation of the force and direction of wind by the teacher will lay observational foundations for the child to understand general wind system to be learned in higher grades.

## USE OF COCONUT SHELLS

Coconut shell can be obtained almost everywhere. In every temple coconuts are broken and shells are thrown away, the 'narial paniwali' throws away many shells daily. This is a common practice in cities and also in rural areas. In every home coconuts are used for one or the other purpose and shells are thrown away. Coconut shells can be put to different uses—at home and at school and even in offices. Besides getting things of utility one can employ one's spare time usefully for this hobby. In schools it is more so. There coconut shells can be used as a medium of instruction also.

Various types of coconut containers by trying different shapes and sizes like flower-vases, drawing-room decorations, etc., can be easily

prepared. A number of articles of use could be made out of these thrown away shells. A few of them have been described as follows :

### 9. Pen Stand

*Tools and materials required :*

1. A coconut shell.
2. Tenon saw.
3. A file.
4. Polish

*Method :*

*1st Stage :* Coconut shell having a diameter of  $3\frac{1}{2}$ " to 4" as a base may be selected. The top portion at the height of  $1\frac{1}{2}$ " from the base may be cut off with saw. Extra portion at the base should also be levelled with the saw or filed properly. Bottom portion will act as base and the top one for holding pens and pencils.

*2nd Stage :* A deep cut of  $\frac{1}{4}$ " may be marked out with a round file to hold a pencil or a pen conveniently. Filing out at three places to hold two holders and a pencil will be convenient. See Fig. 10.

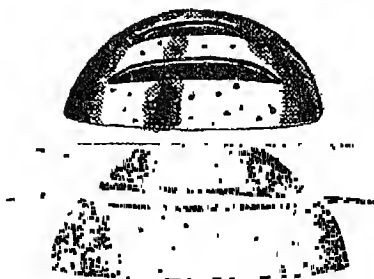


Fig. 10

### 10. Flower-Vase (coconut-shell)

Flowers are not only a source of beauty and attraction but a tonic to mental happiness and health. To get them fresh and to preserve their lustre, a container is indispensable. A flower-pot in a house does not engage one in only collecting flowers from some garden, but helps keeping mental health sound. It is so of aesthetic decoration of the house. Most of our houses, especially in villages cannot provide themselves with costly flower-vases. It is, therefore, high time to cultivate good habits in our children and start working things of utility like flower-pots out of coconut shells which cost almost nothing.

*Tools and materials required .*

1. Coconut shell.
2. A piece of galvanized wire No. 10.
3. A piece of sand-paper No. 0.
4. A drilling machine.
5. A small saw.

*Method :*

*1st Stage :* A piece of coconut shell varying from 3" to 4" in diameter according to the size of the flower-vase be taken.

*2nd Stage :* Unevenness at the base may be removed by sawing or filing.

**3rd Stage :** A number of holes of  $\frac{1}{8}$ " in size from the top to the bottom should be drilled. Some 10 to 15 holes round the shell will be quite enough.

**II Improvised Method :** In case there are no tools, one can select a naturally cut coconut shell of the above dimensions. A long piece of G wire No. 10 should be made red hot either on charcoal 'shegadi' or a stove flame and holes in the shell can be made by burning with a hot wire.

**4th Stage : Finishing :** The fibrous materials can be burnt by carefully holding shell on fire. Some portion of the shell may be burnt lightly here and there to give an attractive appearance. The outer portion can be smoothened with glass paper and a little edible oil can be applied to polish it. Polishing it with Lac-polish will give better results as shown in Fig 11.



Fig 11

through flowers and flower-pots.

If a school has a little garden, let every child decorate the class-room with flower and with decorated flower-vase. Children may be advised to decorate their homes also. This will help in developing the aesthetic sense in them and will gradually take them to plant life

### 11. Device to take out Water

This device is most commonly used for taking out water from river poddles or from drinking water storage. The idea behind using this contrivance is to avoid contamination of water. Mostly school children take out water using drinking glasses used by others. This device will help in maintaining cleanliness and in learning proper health habits.

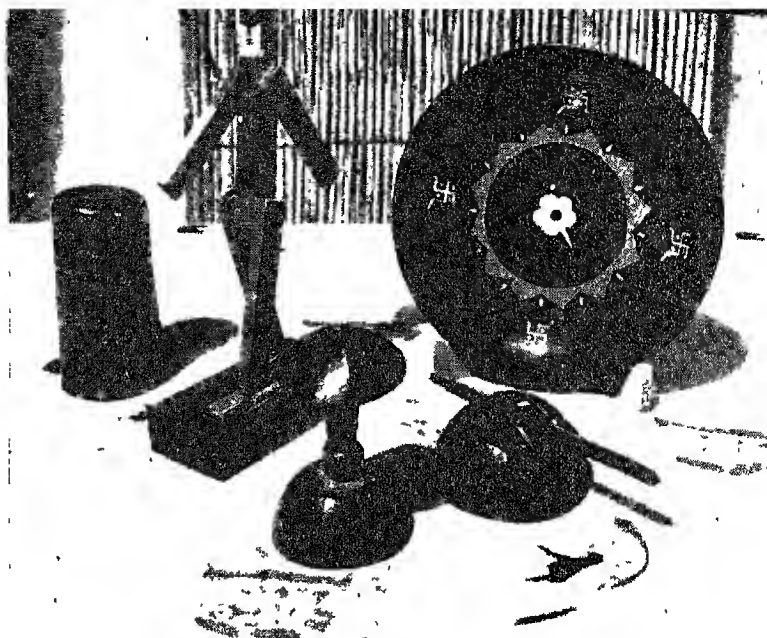
*Tools and materials required :*

1. Coconut shell.
2. Piece of bamboo of 12" in length.
3. Nails of  $\frac{1}{4}$ ".
4. Knife.
5. File.
6. Sand-paper.
7. A saw.

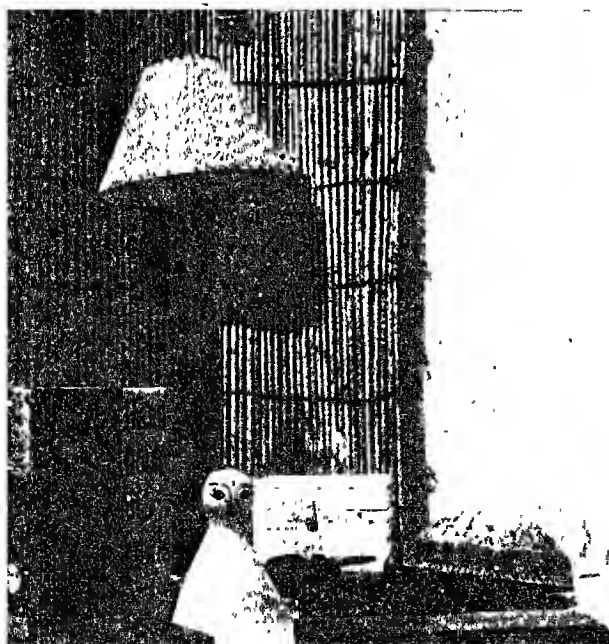
*Method :*

**1st Stage :** Select half bottom portion of a coconut shell.





Bamboo box, Wooden  
Agarbatti-stand  
Fruit plate



Book stand, Lamp stand,  
Takli-box, Bamboo and  
Egg Doll, Papier  
Mache cup

*2nd Stage* : Cut out the open portion if it is uneven.

*3rd Stage* : Burn the shell to remove the fibrous matter.

*4th Stage* : Burn it lightly still further to give black colour to the shell.

*5th Stage* : The outer part is smoothened by sand paper.

*6th Stage* : Two holes are drilled just below the one end. If drilling machine is not available holes are drilled with a red hot wire.

*7th Stage* : A bamboo piece of 12" in length and 1" in diameter is taken. It is split at one end and is inserted into the rim of the shell and nailed.

*8th Stage* : Finish is given with a piece of sand-paper or a piece of broken glass pane. (See Fig. 12).

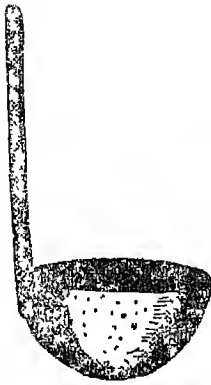


Fig 12

## 12. 'Agarbatti' Stand

Every house needs an 'agarbatti' stand. This can be made easily by children of Basic schools.

*Tools and materials required :*

1. Coconut shells—2.
2. A bamboo piece 3" in length and 1" in diameter.
3. A saw.
4. Sand-paper.
5. Drilling machine.
6. 2 screws.
7. A file.

*Method :*

*1st Stage* : A piece of coconut shell is cut with saw to the size 1" in height and 3" in base. The other coconut shell is cut to the size 2" in diameter and 1½" in height to form the base of the stand (see Fig. 13). The bamboo piece is scraped in the middle leaving 1" or 2" at both ends. One hole is drilled at the top of the shell 'A' and screwed down to the bamboo piece 'B'. Similarly another hole is drilled in the shell 'C' at the top and screwed to the bamboo piece 'B'. Four small holes are drilled in the shell 'A' just at the top to the size of an Agarbatti stick.

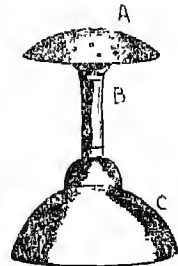


Fig. 13

*2nd Stage* : With the aid of sand-paper the surfaces of bamboo piece and coconut shells are smoothened. Thus the 'agarbatti' stand will be ready for use.

NOTE : In the 'agarbatti' stand the top shell is screwed. But if it is screwed with its top upwards it can form deep stand or ash-tray. Red hot iron wire can also be used to make holes in case drilling machine is not available. Shells could be lightly burnt to render black colour to the shells and finally polished with shellac polish

For the use of coconut shells for ash-tray, buttons, bangles, funnel, and gum-pot, see figures 14, 14-A, 15, 16 and 17

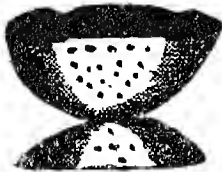


Fig. 14



Fig 14A



Fig. 15



Fig. 16



Fig. 17

## USE OF SCRAP WOOD AND BAMBOO

### 13. Device for Drying Clothes

Great difficulty is felt for drying clothes in homes. The necessity has been felt to make a device which can be accommodated in a small space. The same can be made out of scraps.

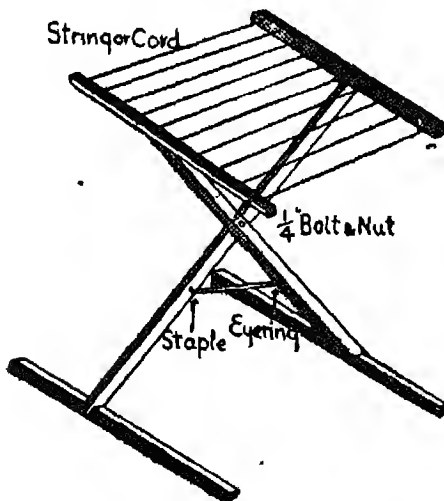


Fig 18

*Tools and materials required :*

1. A saw.
2. A drilling machine.
3. Some string.
4. A nut and a bolt.
5. Bamboo pieces.

*Method :*

Four pieces of bamboo about 2" in diameter are taken for the cross-bars and two more each measuring 4' long for the cross legs are selected. Cross-bars are made first. In the centre of each 2 slots are cut. 9 holes are drilled each of 1/8" in diameter in a straight line and leaving equal distance from the ends. 2 cross-bars without holes are made for the

distance from the ends. 2 cross-bars without holes are made for the



bottom in the similar way. Two cross-bars, going diagonally across the centre of the cross-bars are made in the same manner. A hole is drilled at the point where the cross-bars cross. Here they are fastened with  $\frac{1}{4}$ " nut and bolt. An eye ring is screwed about 6" from the bolt hole to the side of the bar. To the other cross-bar a staple is fixed at the same distance from the bolt. The staple can be attached to the eye ring to fix up the stand in position. In order to assemble, the bolt is fixed through the cross-bars with washers on both sides. The top is threaded with thick string or wire starting at the outside and finishing at the others and secured by nuts. Now a useful gadget is ready for use. Clothes can be placed on the strings. There is sufficient free space for clothes to facilitate drying quickly as shown in figure 18.

#### 14. Coat Rack

This article forms a simple introduction to carpentry. Practically really useful wood work can be turned out even out of a scrap.

##### *Tools and materials required:*

1. Tenon saw.
2. Plane
3. Drilling machine.
4. Screw-driver.
5. Foot-rule.
6. Screws.
7. Pegs.
8. Packing-cases
9. Sand-paper.

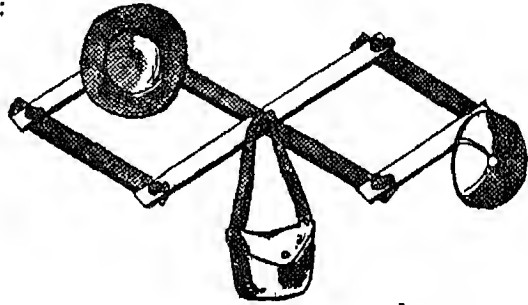


Fig. 19

##### *Method .*

**1st Stage :** A couple of pieces of wood measuring about 3" should be cut from planks of wooden packing-cases. This should be smoothened with plane and finally with sand-paper. One piece should be cut into four lengths of 9" each. The other piece should be cut into 2 lengths of 17" each. The saw edges should be smoothened with sand-paper and plane.

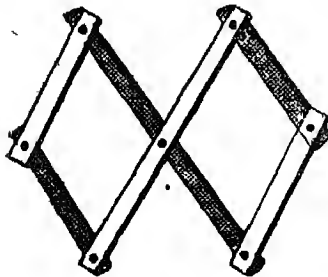


Fig. 20

as shown in figure 20.

**2nd Stage :** Each piece should be drilled  $\frac{1}{8}$ " from the end and hole at the centre of each long piece should also be bored.

**3rd Stage :** Lengths of pieces are arranged as shown in figure 19 and they are fastened together by passing a thin 1" screw through each hole.

**4th Stage :** 7 pegs either cut out from wood or bamboo are screwed at 7 places

**5th Stage :** By the use of sand-paper and polish or paint a final finish should be given to the article to make it attractive.

### 15. Balance

In Basic schools with spinning and weaving as craft, balance (Tarazoo) is a necessity. It is needed frequently for measuring cotton and for assessing the work on cotton. The supply of balance with weights to everyone of the Basic schools is a costly affair. The same can easily be prepared in the school using very cheap bamboo pieces.

*Materials required :*

1. Pieces of bamboo.
2. A fire-wood block.
3. Two card-board pieces.
4. A twine.
5. Some pieces of assorted stones.

*Method :*

**1st Stage .** A block 8" in diameter and 4" in height is cut from fire-wood.

**2nd Stage :** The surrounding bark is removed and planed.

**3rd Stage :** A hole of 2" in diameter is made at the centre.

**4th Stage :** A piece of bamboo measuring about 27" in length and 2" in diameter is taken and smoothened. It is fixed firmly in the block which acts as base.

**5th Stage :** Another piece of bamboo about 1" in diameter and 8" in length is taken and one end is nailed over the top of the verticle bamboo piece and a hole is drilled from the other end. This completes the stand for the balance.

**6th Stage :** To serve the purpose of a beam, a solid bamboo piece of about 1" in diameter and 20" in length is taken up.

**7th Stage :** It is first peeled of with a knife and mark is made at the centre leaving 10" on either side of the centre.

**8th Stage :** From the centre, both ends are tapered to make them  $\frac{1}{2}$ " in diameter.

**9th Stage :** The central point is then held over a pin-point to see that the rod is perfectly horizontal. In case it is not horizontal, the extra portion of the weighty end is removed to make it horizontal.

**10th Stage :** A hole is now drilled at the centre.

**11th Stage :** A stout thread with a knot at the end is passed through the hole of the horizontal rod.

**12th Stage :** 2 more holes at the distance of  $\frac{1}{4}$  from both ends of the beam are drilled.

**13th Stage :** 2 pieces of 8 in. square are cut from a thick card-board to be used as pans.

**14th Stage :** 4 holes are drilled at four corners of the card-board pieces and stout strings are passed through the holes with nuts at the end.

**15th Stage :** These 4 strings are then passed from the hole of one end of the beam and fixed with a knot. The balance will thus be ready as shown in figure 21.

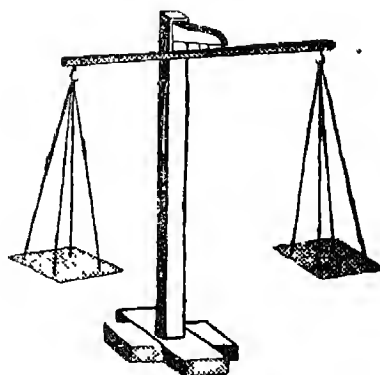


Fig. 21

As regards weights of different measures, they could be borrowed temporarily and should be made equivalent to the weights. Different denominations be written on each stone. These stones could be used as weights. A fine finish as described elsewhere in this publication should be given to the bamboo to give an attractive appearance.

It is important from the educational standpoint that the children should be encouraged to weigh different things and understand different weights and to prepare tables of weights. Addition and subtraction of number or small multiplications or divisions can be introduced and carried further.

**II. Improved method:** In case there are no tools suggested above, one can select half-cut coconut shell. Open portion can be used as a base. An iron rod of  $\frac{1}{4}$  in. diameter is made red hot in a charcoal 'shegadi' or by holding it on stove flame. This rod is used for burning the portions as suggested above to hold three pieces—one pencil and two holders.

**4th Stage :** Outer side of the prepared article is exposed to fire to destroy all the fibres, sticking shell. Burning lightly the top portion of the coconut shell will give a better appearance to the finished product. The burnt portion can be rubbed off or cleaned with a glass paper of No. 1 first and then with glass paper No. 0 to give fine finish. Some edible oil may be applied to it and allowed to dry for a few minutes to give it finer touches. Lac polish will give better appearance and shall be best substitute of some oil. The article will thus be ready for use.

## 16. Simple Balance

Basic schools need a delicate balance to weigh slivers and small quantities of hand-spun yarn. The balance described here does not need any weights, and despite of that it gives accurate weights. It weighs up to 2 ounces. It is an interesting device which can be made out of waste wooden scraps materials.

### Tools and materials required :

1. Pieces of wood.
2. A piece of thread.
3. Metallic tin disc.
4. Drilling machine.
5. Chisel.
6. Saw.

### Method :

**1st Stage** . The base is made from the wood  $\frac{1}{2}$ " in thickness out of a piece of wood  $2'' \times 10'' \times \frac{1}{2}''$ . The upright post is prepared out of a piece of wood  $\frac{1}{2}'' \times 11'' \times 10\frac{1}{2}''$ .

**2nd Stage** . The end of the post is notched  $\frac{1}{2}''$  on each side to a depth  $\frac{1}{2}''$  as shown in the figure.

**3rd Stage** . The top is founded to a radius of  $\frac{1}{2}''$ . The position of the mortise for the post is set 3" long and  $\frac{1}{2}''$  from the back, making it  $1\frac{1}{2}$  square. The easiest way of cutting the mortise is to drill the hole slightly under  $\frac{1}{2}$ " diameter and finish it with sharp chisel.

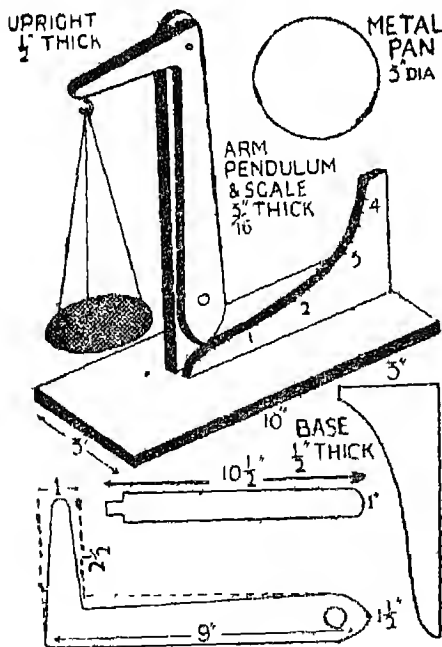


Fig. 22

**4th Stage** : The arm is shaped to the dimensions given in the diagram out of piece of wood measuring  $3/16'' \times 9\frac{1}{2}'' \times 4''$ .

**5th Stage** : The shape is set from the central lines sawn out as shown in figure.

**6th Stage** : A hole is drilled at the intersecting centre lines to take  $\frac{3}{4}''$  wire nail and another as drilled  $\frac{1}{4}''$  in diameter near the shape end approximately 1" upward

**7th Stage** . The later hole is intended to carry counter poise weight which can be made by melting a scrap of lead, if found necessary

The strip of wood for the scale or weight markings is 7" long 3" high at one end and  $\frac{1}{2}''$  at the other. The radius of the curve should be equal to the length of the arm and should be approximately a little over 9". The strip of wood should be fixed in position first and then the arm should be attached to the post so as to give sufficient clearance.

The pan should be cut in shape from an odd piece of tin (kanastar). Holes are drilled equi-distant at 3 points and then it is suspended from a hook driven in projecting arm using strong thread. The counterpoise is adjusted if necessary. Some suitable weights are borrowed to mark out correct divisions on the scale as shown in figure 22.

To weigh a thing without usual weights may be attractive device for the children. This will be an exciting experiment for them.

### 17. Book Rack

Planks from packing-cases can be put to various uses and book rack is one of the articles which can be made out of waste packing cases

*Tools and materials required .*

1. A saw.
2. Drilling machine.
3. Hammer.
- 4 Sand-paper.
5. Polish
6. Some waste packing-cases.

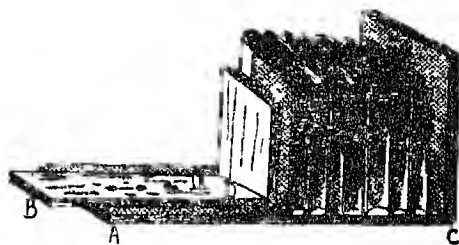


Fig 23

*Method :*

*1st Stage .* One piece measuring  $18'' \times 4\frac{1}{2}'' \times 1\frac{1}{2}''$  and three pieces each measuring  $7'' \times 4\frac{1}{2}'' \times \frac{1}{2}''$  are cut from a packing-case plank and are smoothed by planing.

*2nd Stage :* One of the small pieces is nailed firmly to one end of the long piece at right-angles as shown in figure 23.

*3rd Stage :* The other 2 pieces are nailed together at right angles as shown in figure 23, leaving 6'' from the end of the longer piece AC.

*4th Stage :* A number of holes 2'' apart are drilled in the piece AC as shown in the figure. Similarly three holes are drilled in the piece BD at 2'' apart in the central line.

*5th Stage .* A peg of suitable length to pass through two holes of CA and BD is made. The piece BD is placed on CA.

*6th Stage .* The piece BD can be fixed at any convenient place putting the peg through the two holes.

*7th Stage :* Thus the rack will be ready and the same can be made attractive by giving a good finish of spirit-polish or varnish paint.

### 18. Catapult (Gulail)

It is the ambitions of every boy to possess a sling and to practice with this until he has reached such a set of prowess that he is able to hit any given target with his missile. One can buy these at stores, but they are expensive. It is better to make one out of mere scraps.

*Materials required :*

1. A piece of rubber from motor-tube.
2. A piece of leather.
3. A pronged stick.

*Method :*

**1st Stage :** A piece of wood similar to the given drawing is cut from a branch of a tree. This should be more than 9" in length.

**2nd Stage :** A hole of about  $\frac{1}{4}$ " in diameter is drilled in each of the arms to thread a twisted piece of rubber cut out of an old motor rubber-tube measuring 15" in length and  $\frac{3}{4}$ " in width.

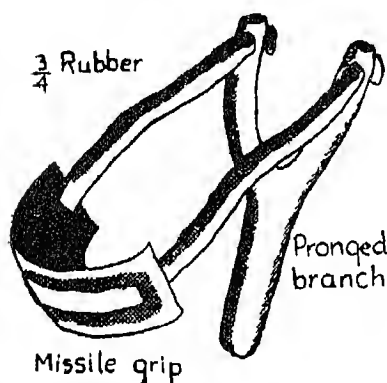


Fig. 24

**3rd Stage:** The two ends of the rubber strip are tapered to thread through the holes of arms.

**4th Stage :** A piece of soft leather measuring  $2\frac{1}{2}$ " long,  $1\frac{1}{2}$ " wide is cut out of some discarded leather.

**5th Stage :** Two cuts are made in the leather with a sharp knife or razor blade to thread the rubber strip through.

**6th Stage :** Now the two ends of rubber are threaded through the rubber arms (prongs) and two safe knots are made. The catapult is

ready for use as shown in figure 24.

Aiming at a thing accurately is taught in physical education, Elasticity of rubber and other things and the necessity of closing of eye while aiming at something may be discussed according to the curiosity of the children.

### 19. Coat Hanger

Packing-cases are the cheapest and best materials for making coat hangers.

*Tools and materials required :*

1. A plank of wood measuring  $16" \times 2" \times \frac{1}{4}"$
2. A piece of stout wire.
3. A stick of bamboo  $\frac{1}{4}"$  in diameter and 16" in length.

4. Drill.
5. Saw.
6. Plane.

*Method :*

*1st Stage :* A shape of the hanger is cut out of the plank as shown in figure 25. The curved ends must be  $\frac{3}{4}$ " in height.

*2nd Stage :* A bamboo stick  $\frac{1}{4}$ " in diameter and 16" in length is cut and is made smooth with knife and the ends of this stick are nailed to the two curved ends of the hanger as shown in figure 26.



Fig 25

Fig 26



Fig 27

*3rd Stage :* At the centre of curved stick a hole is drilled and a stout wire loop is fixed. Coat Hanger will thus be ready as shown in Fig. 27.

The processes involved in making of a coat hanger are—sawing, drilling and nailing.

## 20. Blotter

A handsome blotter can be made out of a scrap of wood taken from waste packing-cases.

*Tools and materials required :*

1. A piece of wood measuring 6"×3"× $\frac{1}{4}$ ".
2. A piece of sand-paper.
3. A piece of wood measuring 5 $\frac{1}{4}$ "×3"×1 $\frac{1}{2}$ ".
4. A piece of blotting-paper.
5. A drilling machine.
6. An old drawer handle.

*Method :*

*1st Stage :* A piece of wood measuring 6"×3"× $\frac{1}{4}$ " is taken and smoothened with sand-paper.

*2nd Stage :* A hole is drilled in the centre to fix the handle.

*3rd Stage :* This wooden handle is selected from an old drawer. It would be nearly 1 $\frac{1}{2}$ " in diameter with  $\frac{1}{2}$ " in shoulder cut to fit in the hole at the top of the blotter.

*4th Stage :* A screw is screwed through the centre of the handle so that the end is inserted at least  $\frac{3}{4}$ " below the shoulder.

**5th Stage :** Now hold the base of the blotter which is a piece of wood measuring  $5\frac{1}{2}'' \times 3'' \times 1\frac{1}{2}''$  and shape it into a smooth curve as illustrated.



Fig 28

base and of sufficient length so that it will be  $\frac{1}{2}''$  extra at each end. It is wrapped round the base as shown in the diagram.

**8th Stage :** The screw end is then screwed into the hole. This will tighten up the top to the base and hold the blotting-paper in position. The blotter is thus ready for use as shown in figure 28.

**6th Stage :** A hole is drilled in the top centre to take the point of the screw thread from the knob.

**7th Stage :** Then a piece of blotting-paper is cut to the width of the

## 21. Use of Waste Bamboo

Bamboo is most commonly used both in rural and urban areas for various purposes. After it is used for bigger articles, there are plenty of small pieces which go waste. Either they are thrown away or burnt as fuel for domestic purposes. This wealth of bamboo waste can be utilised for making beautiful and useful articles. In making these things one requires a little imagination, resourcefulness and the habit of doing things with hands.

Bamboo is available in plenty almost everywhere in India. The strength of culms, their straightness, smoothness and lightness combined with hardness, hollowness, the facility and regularity with which they can be split and the range in sizes, etc., make them suitable for a wide variety of uses for which other materials like wood would require much labour and preparation. This craft can be started in schools with even limited tools and with lesser amount of operations for making a number of articles of utility in homes and schools; viz. fencing for school compounds, floor mats, mattings, yokes, axles, tool handles, beds (cots), buttons, sticks, 'lathis', 'gutkas' tents and flag posts, kites, umbrellas, musical instruments, bows and arrows, baskets, flower pots and vases, oil containers, pegs, forks, spoons, knives, hand-bags, vegetable bags and a number of other useful articles of furniture, etc., etc.

## 22. Pair of Stilts

Children love to ride on stilts. In villages children make their own stilts and walk with these stilts, especially in rainy season. Here is described an inexpensive method of making a good pair of stilts.

*Tools and materials required :*

1. Two bamboo pieces each of 5'' in length.
2. Two planks of wood measuring  $6'' \times 4'' \times 1''$ .



3. A saw.
4. A chisel.

*Method :*

*1st Stage :* Take two bamboo pieces each measuring 5" in length and  $1\frac{1}{2}$ " in diameter at one end and 1" at the other end.

*2nd Stage .* Leaving 2" from the thicker end, the top portion of 2" is scrapped or planed evenly to have a uniform diameter of 1.

*3rd Stage* A hole, 1" in diameter is chiselled or drilled in each plank leaving 1" from one end. These planks are inserted from the top end of the bamboo pieces and allowed to rest on the thicker point 2" from the end of the bamboo pieces. The diameter of the bamboo being more than the hole at the point, the planks will not slip down. These two planks form the foot-rest. It is still safer to drill and fix two nails through the bamboo piece just below the foot-rest. The pair of stilts is ready for use. See figure 29. Walking with ease and confidence will come with a little practice

A practice of walking with stilts will help keeping up bodily balance.

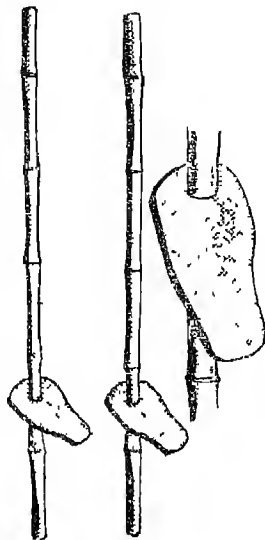


Fig 29

### 23. Bamboo Box

*Tools and materials required :*

1. Hollow bamboo piece of about 4" in diameter.
2. Sand-paper.
3. Spirit-polish.
4. Plane
5. Saw.
6. Chisel.
7. Galvanised wire.

*Method :*

*1st Stage :* A hollow bamboo piece having 2 rings intact measuring about 8" in length and 4" in diameter is taken. It is sawned into two pieces—2" and 6". It is to be noted that 2 rings at ends are intact. The smaller piece will form the lid and the bigger one the body of the box.

*2nd Stage :* The outside portion of the bamboo piece is planed to remove the skin. In order that the lid fits firmly to the body it is necessary to chisel out some portion from inside the lid and of the body from a similar portion outside so that chiselling should be up to 1" and the lid fits firmly to the body.

*3rd Stage :* Chiselled portions should be scrapped with sand-paper to make even and smooth.



Fig. 30

*4th Stage :* Outside portions of the ring should be closely sawned to make them flat.

*5th Stage :* In order to decorate the box, it should be burnt at different places with a red hot G. wire to give some textural effect.

*6th Stage :* It is then scrapped with sand-paper.

*7th Stage :* Finally it is polished with spirit-polish or painted with varnish colours. In case it is required to be designed with oil paints, the same is possible without any burns.

## 24. Electric-Stand

Electric-stand made of wood or some other materials is very costly. The same work can be executed even with bamboo to fetch a good price in the market. The same can be put to use even in schools, houses and in the offices.

*Tools and materials required :*

1. Hollow pieces of bamboo 18" in length and 4" in diameter.
2. Sand-paper
3. Polish
4. Plane.
5. Saw.
6. File
7. Iron-bar.
8. Screws.

*Method :*

*1st Stage :* A hollow piece of bamboo 18" in length and 4" in diameter is taken and its rings are removed with file.

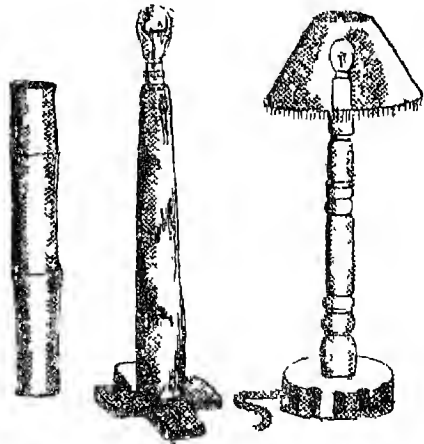


Fig 31

*2nd Stage :* Thereafter the whole length is planed with a plane. However, ring at one end should be kept intact as it will form the base of the stand.

*3rd Stage :* Take another piece of hollow bamboo 8" in length and 4" in diameter. Split the same into two parts length-wise.

*4th Stage :* A slit is made at the centre of one of the pieces 3" in length from the centre measuring  $1\frac{1}{2}$ " on either side of the centre.

**5th Stage :** The other piece is fixed into the slit and the top portion is planed. The bamboo piece for the stand is fixed at the centre of the base with the screws.

**6th Stage :** An iron-bar is made red-hot and passed through the top end to make a hole all through, in order to allow thick wire to pass through the ring portions.

**7th Stage :** Now the whole stand should be sand-papered and made smooth.

**8th Stage :** Whatever decorations may be required are possible on it with paints or varnish polishes, 3 to 4 layers.

**9th Stage :** Finally a thick holder and 'shade' may be fixed with wire going through the bamboo stand as shown in figure 31.

## 25. Takli Box

In Basic schools we need a box to keep 'takli' and slivers. The same box can be made out of a hollow piece of bamboo as given here.

*Tools and materials required :*

1. A saw.
2. Screw.
3. Plane.
4. A hollow piece of bamboo.
5. Sand Paper No. 1½.

*Method :*

**1st Stage :** A hollow piece of bamboo measuring 4" in diameter and 10" in length between two rings (or nodes) is taken. It is cut with hand-saw keeping the circles intact. It is then sawned on all the four sides to make it rectangular. It should be cut in such a way that the hollow portion is not touched and sufficient margin is left between the sawned edges and hollow portion.

**2nd Stage :** To make a lid, one side is sawned and made flat by planing. Now three sides will be left back. The box and the lid are made smooth by the sand-paper. They are, then scratched as indicated in the experiment of walking stick. They are made smooth by rubbing with sand-paper No. 1½.

**3rd Stage :** The lid is made moveable by fixing it to the box with a screw.

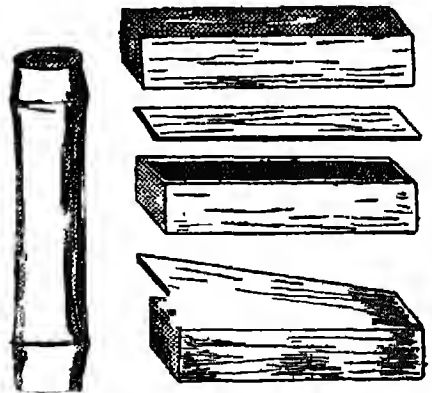


Fig. 32

**4th Stage :** The box is ready. The same can be polished and used as 'takli box' or pen-box as shown in figure 32.

## 26. Walking Stick

Walking sticks are in great demand in rural and urban areas. People in cities prefer walking sticks with designs. Such sticks are costly not because the materials are dear or rarely available but on account of the artistic work done on sticks and time and labour thus taken by it. Walking stick can be made out of branches of a number of trees and bamboo. For school children, bamboo is the best material for easy operations.

*Tools and materials required :*

1. A piece of solid bamboo.
2. Sand-paper No. 1 & 0.
3. Plane.
4. A saw.
5. Rough and round file.
6. Broken pieces of glass.

*Method :*

**1st Stage :** A straight bamboo piece measuring of  $3\frac{1}{2}$ " in length and 1" in diameter is taken as shown in the figure.

**2nd Stage :** Its rings are removed with a rough file and the upper layer of the bamboo piece is skinned with plane or scrap with a piece of glass. If bamboo is green—scrapping should be done in such a way that one end of the piece is left  $\frac{2}{8}$ " in diameter and the other is tapered to  $\frac{3}{8}$ " in diameter. Thus the stick will be a tapered one.

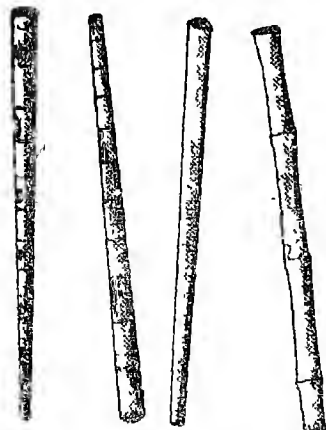


Fig. 33 Fig. 34 Fig. 35 Fig. 36

**3rd Stage :** The end having a bigger diameter will act as the handle. With a round file artificial rings at a distance of 2" as shown in the figure are made and the end at the handle side should be rounded with a file.

**4th Stage :** The alternate culms portions between rings have to be slightly scratched for decoration. This can be easily done by wrapping a strip of wet cloth on the culm not to be scratched. Stick is held over the flame or fire and the space between the nodes is slightly scratched to get a black colour here and there. When wrapping is removed some culms will appear black and the alternate culms will appear white.

**5th Stage :** The stick is smoothened out with sand-paper No. 1. The scratched portions should be sand-papered to remove a little more to remove extra scratchings to impart light black colour.

*6th Stage :* Stick is now made very smooth by rubbing it with sand-paper No. 0.

*7th Stage :* (a) In the final stage lacquer polish is applied a number of times to give glassy appearance. (b) Decoration work may be done with a red-hot wire also. (c) It can be designed according to our requirements. See figures 33, 34, 35, and 36.

## USE OF LEATHER SCRAPS, EGG SHELLS AND STRAWS

### 27. Use of Leather Scraps

There are a number of articles which are made out of leather. Waste leather is thrown away which can be put to a number of uses. Discarded shoes, 'chappals', torn suit-cases, money-bags, attache-cases, belts, leather buttons, brief-cases, etc., are some of the examples. A number of useful things such as cover for knives, combs, sewing machines, mending of shoes, 'chappals' money-bags, ladies hand-bags, stove-tank washers, pump-washers, shoe-laces, woggles for scouts, napkins, leather rings, leather whips, shoe gartars, straps for wrist watches, catapult, belt for 'charkha' and many useful articles are amongst others which can be made out of leather scraps.

### 28. Slippers

Here in this chapter we shall learn the use of waste soles of shoes, 'chappals', crape soles, motor-tyres etc.

The pair of slippers which is described here is soft and comfortable. It is quite good for using in houses as bath-room slippers.

*Tools and materials required :*

1. Pieces of rubber lining of motor-tyres.
2. Strong thread.
3. Needle.
4. A pair of scissors.
5. A piece of felt.

*Method :*

*1st Stage :* A pattern for the sole is drawn according to the size.

*2nd Stage :* 2 rubber pieces are selected for each foot and the pattern is put on them and the pieces are cut to the pattern with a pair of scissors.

*3rd Stage :* The two soles are stitched with a strong thread.

*4th Stage :* 4 strips of felt 1" wide and long enough to go across the insteps are selected.

*5th Stage :* 2 each are sewn in form of cross and the slippers get ready for use. See Figures 37 & 38.

NOTE : 2 inner soles of shoes or 'chappals', crape-soles or discarded crape-soles can also be used for the purpose.



Fig. 37

Fig 38

## 29. Pump Washer

Washer is something of utility. When washer goes off, an article becomes in-serviceable. The most affected are the people dependent on cycle-pump, motor pump; and stove pump etc. In many of the cases this article of almost insignificant cost is not available readily and if available they do not serve the exact requirements. The same can be prepared out of scraps of leather as follows :—

*Tools and materials required :*

1. Block of hard-wood.
2. Rod of hard-wood.
3. Chisel.
4. A pair of scissors.
5. Circular punch.

*Method :*

*1st Stage :* A block of hard-wood measuring approximately 8"×8"×6" is taken. The diameter of the hole of the pump tube of the stove is measured and marked on block of wood.

*2nd Stage :* A hole to the exact size of the diameter is chiselled out or drilled to a depth of 1".

*3rd Stage :* Rod of hard-wood measuring 2"×2" and rounded from all the surfaces to the size slightly less than the diameter of the pump-tube is taken keeping into consideration that the rounded part should be 1" in length, so as to take the work of piston from this rod.

*4th Stage :* A circular leather piece out of the upper end of a discarded shoe is cut out with a pair of scissors and soaked in water.

*5th Stage :* The same is placed over the hole in the wooden block. The leather is driven into hole with the help of the wooden strip and a hammer. The leather being wet takes the desired shape. It may be allowed to stay in the same position for a few hours. The rod is then taken away.

*6th Stage :* The centre portion of the washer is trimmed off with the aid of a pair of scissors and a hole is made to the size of the end of the pump rod for finishing the washer.

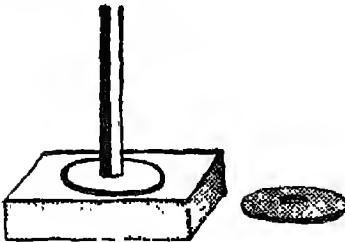


Fig. 39

Fig. 40

If holes of different sizes are made in the wooden block and if the required wooden strips for the purpose are made this device can be utilised readily in washer. Ordinary plain leather washers could be made with a pair of scissors and a punch. Some times the difficulty may arise in making a hole as a right type of punch may not be available. In that case we may make use

of a piece of iron-rod. After making it red-hot and placing it on the leather piece we can get the same results as shown in figure 39 & 40.

### 30. Sewing Machine Belt

Leather belts are used in flour-mills and in many other factories. Almost every village has now a flour-mill. There, belts when discarded are thrown away. We can put the same to uses. Even reins for horses can be put to use. Here is a simple method of making a belt for a sewing machine or 'charkha'.

#### Method :

**1st Stage :** A strip is soaked in water for an hour and is spread on a stoney floor to rub it against a stone pestle after it is soaked as shown in figure 41. The process is continued till the leather assumes the shape of a round cord. The ends of round cord may be joined by a winding wire with two pin holes at each end.

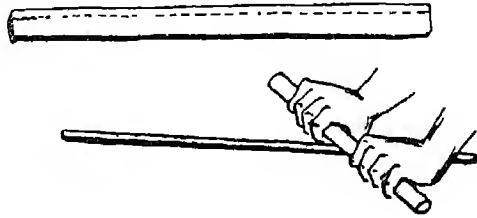


Fig. 41

Strips could be used for plain belts for children after adding a buckle to it.

### USE OF METAL WASTE

#### 31. Blotter

Sometimes we get empty milk tins, canned fruit tins and various types of milk containers. Various sizes of sheets are obtained when these are opened and flattened. If properly cut the size could be used as blotters, washers, wheels for toys and in a number of other ways. Here we shall make a blotter.

Fig. 42



Fig. 43



Fig. 44

#### Tools and materials required :

1. Milk powder tin container.
2. Pair of tin cutter and
3. Plier.

#### Method :

**1st Stage :** Bottom and top portions of the cane are removed and made flat by cutting the tin so as to obtain a flat metallic sheet. Out of this sheet, two pieces measuring  $3'' \times 6''$  and  $3'' \times 6\frac{1}{2}''$  are cut and are strongly turned,  $\frac{1}{4}''$  inside as shown in figure 42.

**2nd Stage :** Out of the second piece, ends are turned  $\frac{1}{4}''$  inside completely to form a border as seen in figure 43.

**3rd Stage :** A light curvature is given to the piece. The ends of this piece should be inserted in the grooves of the first piece.

*4th Stage* : A piece of blotting paper be cut to the size and placed below the second piece and inserted. The blotter will appear as in figure 44.

### 32. Ice Container

One finds it difficult to keep ice for a very long time during summer. Still greater difficulty is felt when it has to be kept for a considerable time when required during emergency (illness, etc.). This difficulty could be overcome by making a very cheap ice container at home out of 2 vegetable ghee containers, instead of purchasing costly one from the market.

*Materials required :*

1. Vegetable ghee containers—2, one meant for 10 pounds of ghee and other which is meant for 5 pounds of ghee, round containers are preferable.
2. Wood wool or Saw-dust.
3. Round piece of wood 4" in diameter.

*Method :*

*1st Stage* : Top of tin meant for 10 pounds of ghee is completely removed.

*2nd Stage* : Tin meant for 5 pounds of ghee is placed on a circular piece of wood inside that tin so that the top of both tins are in level.

*3rd Stage* : Saw-dust is packed firmly in the hollow portion between two tins.

*4th Stage* : Two circular wooden pieces 8" in diameter are taken up and the middle portion is chiselled out keeping the width at the circumference  $1\frac{1}{4}$ ".

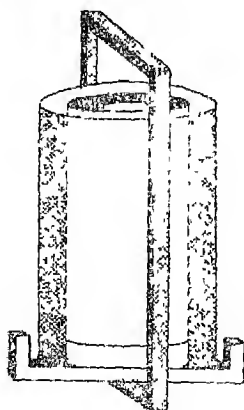
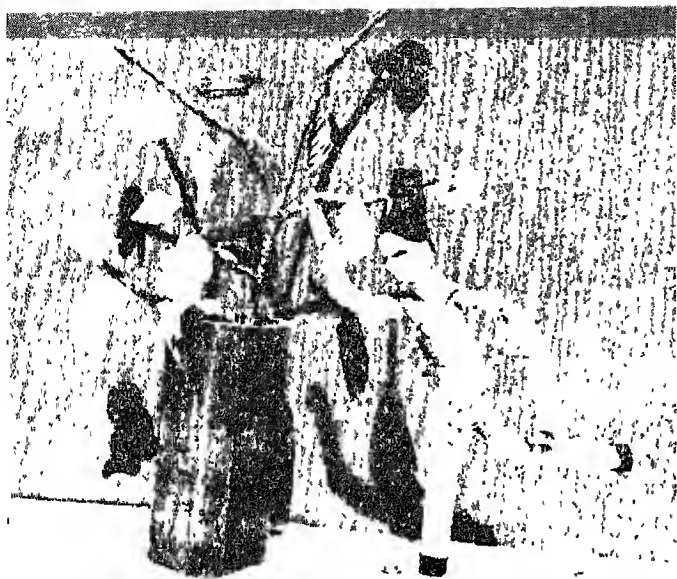


Fig. 45

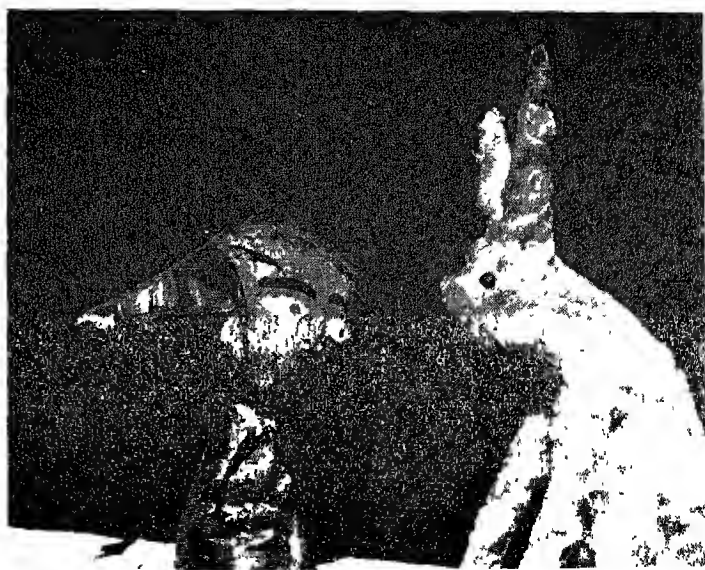
*5th Stage* : One is placed at the top to cover saw-dust or wood wool packing and the other at the bottom. These two planks are joined with nails to two vertical strips each 13" in length. These strips form arms of the handle to hold the container. These two vertical strips are further jointed by a horizontal strip. The ice container thus gets ready for use as shown in figure 45.

To take double precaution we may add saw-dust inside the container for keeping the ice before closing the lid. We may do so outside the lid also. Thus in this way we can keep ice in this cheap container for about 24 hours. This container can be utilised for keeping some hot drinks or be utilised as tiffin-carrier but in this case we should not put saw-dust inside the container.





Shell-tree, Paper Boy



Paper Bag Doll  
and Rabbit



Let children try anything in place of saw-dust and observe the effect. This experiment may help to illustrate good and bad conductors of heat and radiation.

### 33. Razor-Blade Pen-Knife

Used razor blade which is thrown away after shaving can be put to best use if converted to a knife. Children need knives for sharpening pencils and generally used blades which cut their fingers when used without any precaution. To avoid this every-day loss the razor blade is thought to be converted to permanent article in our present description.

*Tools and materials required :*

1. A solid piece of bamboo measuring  $6'' \times 1'' \times \frac{1}{2}''$ .
2. Two small bolts and nuts preferably with washers  $\frac{1}{4}''$  each.
3. A small saw.
4. Hand drill.

*Method :*

Bamboo piece is cut to the size with a small knife as shown in the diagram. One end of the bamboo is turned to the size  $1''$  wide,  $2''$  long and  $1/16''$  thick.

**2nd Stage :** A slit is made in the thin portion for inserting the blade. The blade is placed at the surface of the thin portion keeping  $\frac{1}{8}''$  of the blade portion inside and 2 holes are marked with a pencil on the flat portion of the bamboo piece and drilled with hand drill.

**3rd Stage :** The blade is then removed and inserted into the slit and fixed with two small bolts and nuts using the washers. Now the razor blade is ready for use. See fig. 46.

This knife can be used for lead pencils, cutting papers and vegetables

Whenever old blade is to be changed nuts, bolts and old blade are removed and a fresh blade is inserted, and the bolts and nuts are retightened.

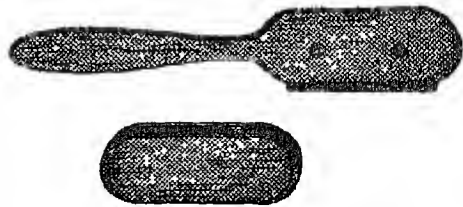


Fig. 46

In order to give this knife an artistic appearance its handle may be polished with spirit-polish.

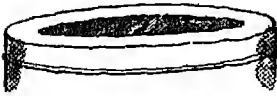
### 34. Pin Cushion

It is observed that typewriter-ribbon containers find no use and when empty are thrown away. Even empty boot-polish boxes are not put to use. Here we shall learn to put them to use as 'pin cushion.'

*Tools and materials required .*

1. An empty ribbon-box.
2. A flat punch.
3. Hammer.
4. A piece of coloured thick cloth.
5. A little sand.

Fig. 47



*Method :*

*1st Stage :* Lid of the ribbon-box or boot-polish box is cut round leaving a space of  $\frac{1}{4}$ " round from the edge as shown in figure 47.

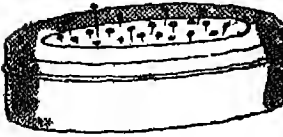


Fig 48

*2nd Stage :* A thick cloth is cut in circular space just to fit in the lid. The box is then filled in with sand and the lid is fitted. Pin cushion is thus ready. Pins can be pierced through the cloth into the sand as shown in figure 48.

Similar process may be followed with other small metallic containers.

### 35. Letter Holding Wire

*Introduction :* There is not even a single house in a village or a town where preserving of letters is not felt essential. Everybody would like to preserve receipts, vouchers and other important papers. These can be safely kept in the letter-holder described here.

*Tools and materials required :*

1. Umbrella wire—1.
2. A square or round piece of scrap wood.
3. A plier.
4. Hand drill.

*Method :*

*1st Stage :* A piece of wood  $2" \times 2" \times \frac{1}{2}"$  is taken and a hole is drilled at the centre of it.

*2nd Stage :* Wire piece of 12" in length from the discarded umbrella is taken to fit the same into the drilled hole. The other end is bent into a semi-circle.



Fig. 49

NOTE : If wooden base is not available a disc cut out of small tin box can also be made use of. See figure 49.

### 36. Contrivance for G-Wire Door Mats

*Introduction :* It is a useful article required in every home to be placed at the entrance of the door to keep away dirt from shoes from

entering the room. It is specially useful during rains to scrap off mud from shoes. It is in considerable demand in offices, bungalows, rest-houses, circuit houses and is an easily salable article. Making of such type of door mats may add to the self-sufficiency of the craft-centred schools. This article can easily be manufactured by children of higher grades. What is needed is an improvised contrivance to make wire strings.

**Materials required :**

Discarded G. wire.

**Method :**

**1st Stage :** As shown in the figure 50, pieces of wood measuring  $18" \times 3" \times 2"$  each are taken. The other end of each is fixed firmly in the ground 6" deep. The two pieces should be 3" apart.

**2nd Stage :** A hole of 1" diameter is drilled in each piece say at A & B leaving 4" distance from the ends.

**3rd Stage :** A piece of hard-wood 3.6' is taken preferably of 'babul'

or 'sheesham' wood and made round, to  $\frac{3}{4}"$  in diameter except at one of the ends which should be made square. This round piece should move freely through the holes AB in the vertical pieces.

**4th Stage :** Now a strip of paper of sufficient length is cut  $\frac{1}{4}"$  wide and wrapped round the rod. To start with, it should be a little slanting and not vertical to each touching.

**5th Stage :** A piece of thick wire No. 10 about 12" in length should be obtained and made red hot. A deep groove is made along the edge of the paper wrapping from one end of the rod to the other as shown in figure 51. The wrapping of paper is removed. If groove is not deep at some place it should be done uniform throughout. This groove helps doubly to hold the wire put into it to check and to give proper direction to the pieces of wire.

**6th Stage :** A handle is fixed at one end of the rod making a square hole in the handle. Two holes of  $\frac{1}{4}"$  in diameter are made in the rod at C & D.

A permanent contrivance could be made, making use of iron angle or iron rod 1" to 3" in diameter.

### 37. Spring Door Mat Making

**Tools and materials required :**

1. Sufficient length of G. wire No. 16.
2. An iron rod frame of the size required.
3. Plier.

Fig. 50

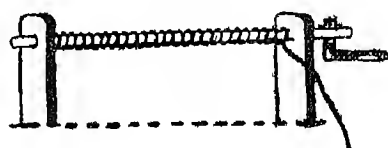
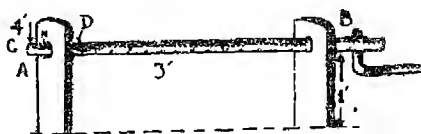


Fig. 51

*Method :*

**1st Stage :** A rod measuring  $5/16''$  in diameter is taken and bent into rectangular shape as shown in figure 52.

Fig. 52

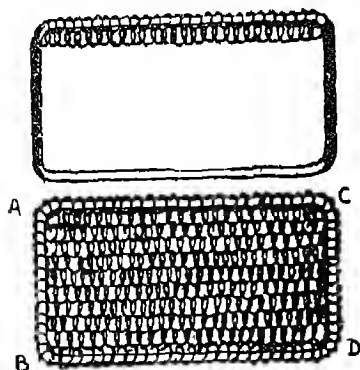


Fig. 53

of the springs is taken up. It is put at one of the long sides of the frame by winding round and round and pushing further.

**5th Stage :** The second spring is pressed through the first. The third spring passes through the second. The last spring passes through the last but one and the rod 'CD' as shown in figure 53.

**6th Stage :** Extra lengths of the springs are cut and bent round the rods AC & BD.

The spring door mat is now ready. It is advisable to paint the mat with aluminium paint to make it attractive.

### 38. Coat Hanger

The coat hanger is a thing of utility and is in great demand everywhere. Everyone who wears coat and trousers needs a coat hanger to keep the crease intact. The same can be easily and cheaply made with the aid of following device :

*Tools and materials required :*

1. A plank of wood  $16'' \times 8'' \times 2''$ .
2. 3" nails 24 in number.
3. A Plier.
4. Galvanized wire No. 10.
5. Hack saw.

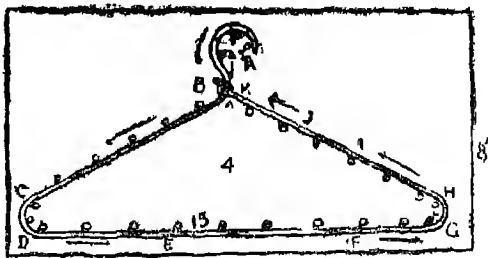


Fig 54

6. A pattern of wire coat hanger of the design we intend making new ones.

**Method :**

**1st Stage :** A plank of wood of the measurement given above is taken. A wire coat-hanger is then taken and is placed over the plank keeping sufficient margin on all sides. The shape is marked out on the plank.

**2nd Stage :** Nails are fixed at the distance of 4" apart over the marked outline as indicated in figure 54.

**3rd Stage :** The heads of the nails are removed with hack saw leaving only 1" from the plank. This is the permanent contrivance for making coat hangers easily.

**4th Stage :** Galvanized wire No. 10 is taken in sufficient length and a small loop is made at the end. It is fixed to the nail 'A' as shown in the diagram. Holding the wire with plier or with a piece of pipe it is bent round the nails in the direction indicated in the diagram till point 'K' is reached. This end is tacked on the original wire at B

Discarded fencing wires, wire rims of cycle tyres etc. can also be put to use for making hangers.

### 39. Shell Tree

**Materials required :**

1. Shells.
2. Thin Galvanized wire.
3. Binding wire.
4. Green crepe paper.
5. Paste.

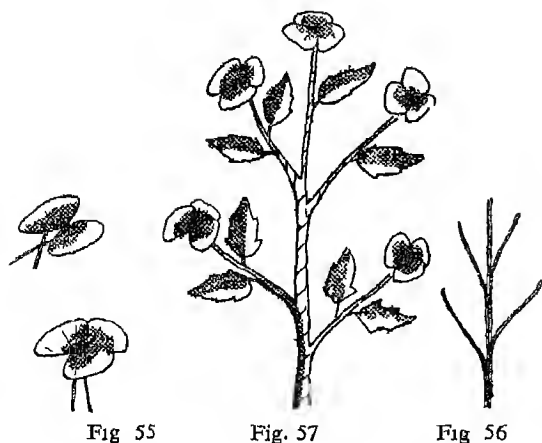
**Introduction :** Sea-shells are utilised for many purposes. Beautiful artistic articles are generally prepared out of thin shells. Shells of smaller sizes have been considered useless and are, therefore, thrown out. Here we shall make use of those thrown-away pieces also. A number of beautiful articles are made and are utilised for decoration purposes.

**Method :**

**1st Stage :** 15 to 20 small pieces of shells are taken and holes are drilled into them. At a time 3 shells are taken and tied together with a thin binding wire in such a way that they look like a flower as shown in figure 55. In this manner 5 to 6 or more flowers are prepared.

**2nd Stage :** With a view to make leaves we can make use of a little bigger shells. With the help of a file they are given the shape of leaves. As mentioned before, holes are drilled at the end of each leaf and is tied with a piece of wire. In this way a number of leaves are prepared and tied.

**3rd Stage :** Some pieces of galvanized wire are taken and tied in such a way that they form the shape of a tree with branches as shown in figure 56. All the shell flowers and leaves are tied to the branches with a thin lead wire in such a way that they look like a tree. Then the trunk and branches are painted with green oil or water paint or green paper is pasted all round it as shown in figure 57. To make the tree stand properly, a good shaped earthen pot or any other



pot is taken and the tree is inserted in it.

#### 40. Paper Weight

Used, fused electric bulbs are put to use filling them with coloured water and using them for decoration. These can be put to more profitable use to make glazed paper weights. They look attractive and are salable also.

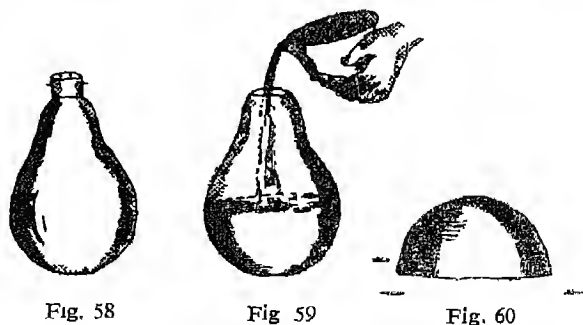
*Materials required :*

1. Fused bulbs.
2. Cement preferably coloured.

*Method :*

**1st Stage :** The metallic top portion of the bulb is carefully removed and a little glass top portion is broken off.

**2nd Stage :** Ingredients like cement—one part, sand—one part are taken and mixed. Water is added to make the mixture semi-fluid. This is poured into the bulb up to its half height. This should be allowed to remain in the bulb for a week. Then the bulb is completely broken off. In case we need to use this used bulb as a mould for many such paper weights then we should apply some grease like



vaselin or oil before pouring the solution or fluid. In this way we shall get finally glazed paper weights. This may be put in water for about a week for the cement to set up.



Cement is available in various colours. In case of requiring an attractive article we may make use of coloured one, otherwise even ordinary type of cement will do. Any picture or design can be made on this paper weight with a little paint and a brush. See figures 58, 59, and 60.

## GLASS AND CHINA

### 41. Drilling holes in Glass

Broken glass panes are discarded and thrown away. The same can be profitably used for making racks for holding shaving kits, and other cosmetic containers. Well cut they could be used as tops for side table. Besides a diamond cutter and a triangular—the tools used for cutting—it is very necessary to know the boring of holes. The following recipe may be useful for the same purpose.

*Material and Tools required :*

1. Hand drill or a bit and brace or a triangular file.
2. Glass pane.
3. Turpentine oil.

*Method :*

Some putty is placed round the spot where the hole is to be drilled. A little turpentine oil is put inside the circle of putty on the glass pane. A drill is placed on the spot where hole is to be drilled and drilling is started at even speed without much pressure. If the grinding noise starts, it means the hole is being bored. When the drill is penetrated through the glass, the drill is used as reamer to enlarge the hole. Plenty of turpentine oil is used to make the drilling smooth and gentle. A broken end of the triangular file can be used in place of a bit as shown in the diagram.

### 42. Making Glass Containers

It has been often seen that broken bottles, glass-jars etc. are thrown away without putting them to any use. These could be used again as drinking pots, flower-vases and for other useful purposes like containers for 'chatnis' and 'pickles'. It is, therefore, essential to know the easiest methods of cutting the broken containers to the size.

*Materials required*

1. A broken jar.
2. A piece of string.

*Method :*

*1st Stage :* Figure 61 shows a jar broken at AA'. This is to be cut round at BB'.

*2nd Stage :* A piece of string is soaked in kerosene oil and tied round the jar at BB'. The jar is filled in with water just to the level of the string.

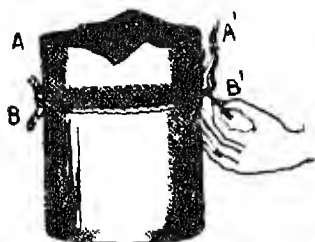


Fig 61

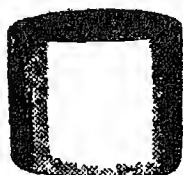


Fig. 62

*3rd Stage :* The string is turned and allowed to burn completely. When it is just burnt, a slight jerk is given to the jar. This will cut the jar round the string as shown in figure 62. This will serve as a dish pot. In the same manner bottles and other containers could be

cut to the size accordingly and used for storing a number of articles.

### 43. Cementing broken China and Glass ware

Many times we are stranded when costly china or glass-ware are broken and they are thrown away. They would be put to better use for ornamental purposes provided it is known what types of cements are used for this purpose.

*Materials required :*

1. Waterproof cement.
2. Plaster of paris—3 parts.
3. White lead—3 parts.
4. Resin—1 part.
5. Litharge—3 parts.
6. Linseed oil

*Method :*

*1st Stage :* Crush all these ingredients to powder them.

*2nd Stage :* Mix boiled linseed oil to make a thick paste.

*3rd Stage :* Apply this paste on the broken parts. Joint them and allow to dry for three days till the cement completely gets set.

This can be done by using the following materials also :

1. White sugar—6 ounces.
2. Fine starch— $1\frac{1}{2}$  ounces.
3. Gum Arabic—2 ounces.
4. Water.

*Method :*

*1st Stage :* All these ingredients are crushed to powder.

**2nd Stage :** A thick solution should be made by adding water. The mixture is kept in boiling water for four hours, till the solution becomes clear.

**3rd Stage :** Paste be applied on the broken parts and joined together and kept for drying and setting for 3 days.

## MISCELLANEOUS

### 44. Garlands

Strips of khadi from which threads can be removed and which are of various colours can be turned into beautiful garlands. They are durable and look artistic to the eyes.

*Tools and materials required :*

1. A piece of thick cloth.
2. Two pairs of scissors.
3. Thread
4. Needle.

*Method :*

**1st Stage :** Strips of cloth 1" wide and 26" long are cut. A few horizontal threads at both ends of the strips are removed. Then each end is loosely held by each child. With the aid of the needle vertical threads of the strip are removed equally from both sides keeping only three threads in the middle as shown in the figure 64.

**2nd Stage :** The strip is then held at both the ends. It is stretched and twisted with needle thread clock-wise and anti-clock-wise at ends till the horizontal threads are spread giving an appearance of a garland as shown in figure 65.



Fig. 63, 64



Fig 65

Combination of two or three different colours will be very attractive

### 45. Batik Work

(Use of waste cotton and silk fabrics)

Batik is a Javanese word which means "wax painting". It is a method of applying dyes to fabric in the form of designs and is accomplished by the use of wax. It is based on the principle that the wax, wherever it is applied, will prevent the dyes. Nearly all washable white silk and cotton fabrics are good for 'Batik' work. It is observed that a number of discarded garments which are thought to

be discarded could be put to most profitable use—say for napkins, table cloths, tea-tray cloths, scarves, wall-hangers, small curtains, handkerchiefs and money-purses, etc. These cuttings may not look attractive unless some decorations are made. The following method of painting pieces of cloth or silk will give an attractive appearance.

*Materials required :*

1. A wooden frame.
2. Candle wax. (Hand Iamaffin wax)
3. A brush.
4. Pictures' cuttings.
5. Dyeing colours.

*Method :*

*1st Stage .* The cloth on which decorations are to be made is just washed and dried. Then it is stitched and pinned to the frame

*2nd Stage :* Cutting of a flower design is placed on the one corner of the cloth and outline is marked out with a coloured pencil. This process is repeated at the remaining three corners. Another suitable design for the centre is selected. The design is placed at the centre of the cloth and outline is marked out with coloured pencil.

*3rd Stage .* The cloth is since ready for painting, the wax is melted in a metallic cup on mild fire and is applied on it with an old brush or old cloth. The design surface is outlined profusely so that the liquid penetrates through the cloth. The process is repeated for all other designs at the corners and the centre. It should be remembered that the wax should always be kept in the liquid form.



Fig 66

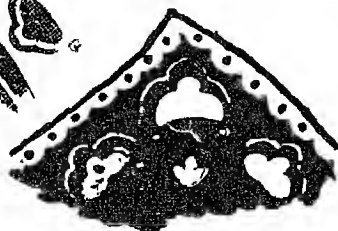


Fig. 67

*4th Stage .* A luke warm solution of the colour is made and the cloth is dipped in it. Cloth is moved up and down with a stick for about ten minutes.

*5th Stage :* Now the next step is to remove the wax. The cloth piece is removed and is placed between two layers of newspapers or blotting paper and pressed with a hot iron until all the wax is absorbed into the paper. In case of non-availability of iron press, it may be improvised by taking a small 'degchi' and

putting burning charcoal in it as shown in figures 66 and 67.

## 46. Felt Bag

Felt is in many ways an ideal material for work. It comes in many colours and being strong, it can be marked and cut out easily. It is easy to sew and pliable enough to adjust to the shape one needs. For this purpose we can put to use overcoats, lady's winter coats, jersies, trousers and felt hats, etc., etc. Even a small piece available out of discarded garment is valuable if put to use. It could be put to various uses such as comb-cases, change-purses, lady's hand-bags, belts, caps for children, drawing bags, cigarette-cases, animals, birds and stuffed toys, etc., etc.

### *Tools and materials required :*

1. A piece of felt or discarded woollen cloth.
2. Needle.
3. Thread.
4. Pair of scissors.
5. Piece of card-board.
6. Piece of coloured string.
7. Pattern.

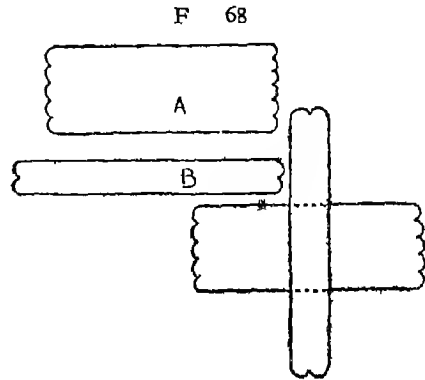


Fig 69

### *Method :*

**1st Stage :** The body of the bag is made of two pieces marked A & B as shown in figure 68. Piece 'B' is fairly long. It is laid across the exact centre of the piece 'A'. A stuffed card-board is placed between the two pieces to make a firm bottom.

Fig. 70

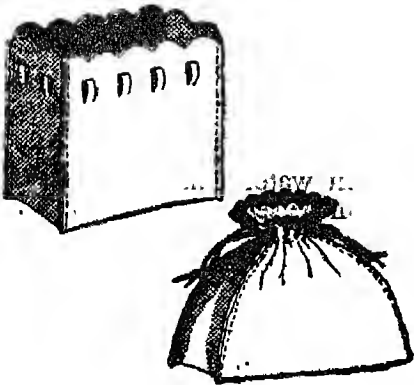


Fig. 71

**2nd Stage :** Two pieces are stitched together round the card-board as indicated in dotted lines in figure 69.

**3rd Stage .** The sides are then stitched.

**4th Stage :** Loops are cut on the sides as indicated in figure 70 and the string is threaded in the loop as in figure 71. The bag shall thus be ready for use.

## 47. Use of Tin Foils

What is popularly known as silver paper is in fact called tin or metal foils. These can be collected out of cigarette, tea, chocolate, tobacco and bottle wrappings. Children love to make small articles.

out of them. These could be utilised to make decorative name-plates for the school or some individual name-plates—headmaster, monitor, school-museum, etc. A visit to a betel-shop ('pan'-shop) early morning gives you sufficient pieces of tin foils. Now here we shall describe making of a name-plate.

*Tools and materials required :*



Fig. 72

1. A piece of white glass.
2. Paste.
3. Tin foils.
4. Black enamel paint.
5. A pair of scissors.
6. A brush.

*Method :*

**1st Stage :** Cut out a piece measuring 12" × 6" out of a broken and discarded glass-pane. The process of cutting the glass is given in this booklet elsewhere. (See Article No. 42).

**2nd Stage :** What is required to be written is drawn with pencil on a piece of paper in thick lines as shown in the figure. Arrangements of letters be given due consideration on piece of glass.

**3rd Stage :** Now take a pair of scissors and cut out letters out of the paper. These letters are pasted on the bottom surface of glass from left to right in a line with suitable margin on all sides.

**4th Stage :** Then the glass turned.

**5th Stage :** The whole surface of the glass except the letters is painted with black enamel paint after letters made out of paper are well stuck on the glass. The paint may be allowed to dry completely.

**6th Stage :** Paper letters are then soaked in water and are removed. In the spaces covered by the letters, these will be seen through glass.

**7th Stage :** Piece of tin foils may be cut and pasted to cover anti-spaces.

**8th Stage :** This may be allowed to dry.

**9th Stage :** To make it attractive, we may frame it with a discarded picture frame or any other used suitable frame. If this is not possible, bamboo pieces could be used to make a very cheap and inexpensive frame.

The other suggestion will be to cut a strip out of a tin-sheet measuring  $\frac{3}{4}$ " in width and bent it lengthwise from the central line to form a channel. A piece of card-board can also be utilised for such a frame by making use of binding cloth.

Another method for making a name-plate or a sign-board will be to write letters called enamel on glass and then cover the remaining portion with tin foils. (See figure 72).

#### 48. Kathari (Quilt)

In every household we find a few useless pieces of clothes and torn garments. It is very seldom that they are put to good use. They can be put to use for making a 'razai', 'quilt'. The inserviceable woollen garments may be used for kitchen rug (coloured garments).

##### *Tools and materials required :*

1. Discarded pieces of coloured garments.
2. A pair of scissors.
3. A needle.
4. Thread.

##### *Method :*

**1st Stage :** Pieces of cloth are neatly cut to different sizes and shapes—round, triangular, square, quadrilateral, etc., of all sorts of designs and shapes.

**2nd Stage :** On a piece of newspaper a design is drawn of the 'razai'. It would like to have as shown in fig. 7. Boldness in conception will be most useful. General 'razai' should be of 6" × 4" so as to be used as an 'asan'.

**3rd Stage :** When the pattern is finalised the pieces are stitched in the style of the pattern. The work seems laborious in the beginning but as it builds up the child enjoys his work. When it is finished it will be the top cover. The other cover can be of plain thick cloth.



Fig. 73

**4th Stage :** These two pieces are sewn together. A sort of bag is thus obtained.

**5th Stage :** Bag is stuffed with cotton.

**6th Stage :** A similar method could be used for making of rugs for kitchen from discarded woollen garments and an attractive tea-cosy out of canvas.

The craft should provide opportunities for children to work in cooperation in groups.

##### *Richness and variety of processes involved in the craft :*

The craft should be rich enough to involve a variety of processes so as to help training of the child's senses and skills.

## 49. Link Belt

Small pieces of felt of any colour could be used for this purpose. This is very cheap to make and is most comfortable to wear.

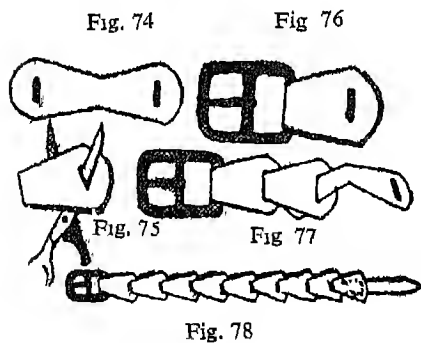
*Tools and materials required :*

1. Piece of felt.
2. Pair of scissors.
3. Chisel.
4. Buckle.

*Method :*

*1st Stage :* Enough links shaped as shown in the figure 74, are cut. Each piece is folded double. It requires many pieces to do so.

*2nd Stage :* Make two slits in each piece. Fold each piece and cut with a pair of scissors as shown in figure 75. This is possible with the help of a chisel also.



*3rd Stage :* When all the links are ready a buckle is taken up looping over one link over the end bar of the buckle as shown in figure 76. Another link is taken up folding the white part and pushing through the slits of the first one. This process is continued until the belt is 1" or 2" shorter than the required one as shown in figure 77.

*4th Stage :* A strip of felt measuring 1" wide and 6" long is sewn to the last link.

*5th Stage :* Punch several holes in this strip at about  $\frac{1}{2}$ " apart from one another. Thus the belt is ready for use as shown in figure 78.

## 50. 'Shegadi'

*Introduction :* Discarded kerosene oil tins, paint containers and buckets find a valuable place in the kitchen if they are transformed. In big cities where the use of firewood is forbidden, coke or charcoal is made use of. This requires a particular type of 'chullha' called 'shegadi'. It could be made easily with the available materials. In order to make shegadi out of a discarded bucket, we shall be required to follow the following process. The same may, however, be used for other containers if there is no bucket available.



*Tools and materials required :*

1. Bucket say of 9" height.
2. Circular oil disc.
3. A pair of tin cutters.
4. A punch.
5. A hammer.
6. Potter's clay.

*Method :*

*1st Stage .* The circular disc is cut out just to fit in bucket 4" above the base.

*2nd Stage .* A number of holes are punched with a punch to allow ash to fall down and the air to get in.

*3rd Stage :* 1" above the bottom of the bucket a rectangular slit measuring 2"×4" is cut to allow to get in.

*4th Stage :* Inside of the bucket above the disc 1" layer of clay is plastered round the wall of the bucket

*5th Stage :* It is then pasted in layers inside the bucket and above the disc. Thickness of clay layer should not exceed 1" to 1.5".

*6th Stage :* After the clay is dried shegadi is ready as shown in figure 79 and 80.

Instead of round punch iron disc, iron rods can also be put to use. This way we can put discarded paint tins, kerosene oil tins and many other kinds of containers and buckets to useful purposes.

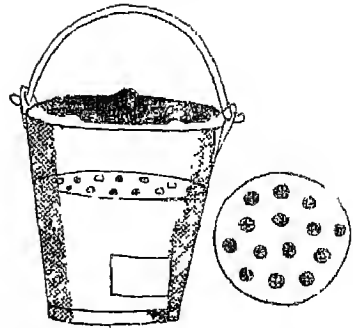


Fig 80

Fig 79

### 51. Shoulder Bag

*Tools and materials required :*

1. Piece of felt.
2. A pair of scissors.
3. A needle.
4. Thread reel.

Fig 81

Fig 82

Fig 84

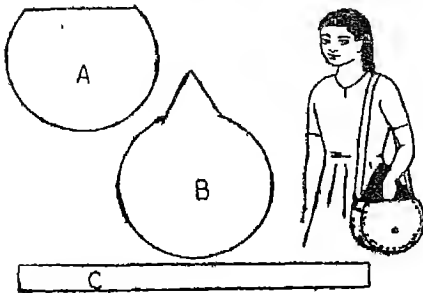


Fig 83

*Method :*

*1st Stage :* A shoulder bag like the one shown in the diagram is made from 3 pieces of felt. Piece 'A' is the front piece, 'B' is the back piece and piece 'C' is the strip that forms the sides of the purse. The front is a circle of 8" in diameter. A small piece is cut off to make a straight edge as shown in figure 'A'. Back is a circle of the same size as the front with a pointed flap at the top 'B'. This flap buttons down over front of the bag.

*2nd Stage* : The side strip 'C' should be 2½" wide and long enough to extend around the front from one end of the flap top to the other.

*3rd Stage* : The pieces are stitched together or holes are punched around the edges of each piece and a lace is threaded through them.

*4th Stage* : A button hole slit is cut in the point of the flap and a button is sewed to match it on the front of the bag. (See figures 81, 82, 83 and 84.)

## 52. Food Cover

Flies are a great nuisance in our villages and even in cities, especially in the slum areas. They are the carriers of many diseases and germs. It is necessary to cover food to protect it against flies. Here is the simple method to make one out of scraps of metal and cloth.

*Tools and materials required :*

1. Galvanised wire No. 16.
2. Piece of cloth from a discarded mosquito-net.
3. Thread.
4. Needle.

*Method :*

*1st Stage* : Take 4 piece of galvanized wire one measuring 56" and the other three 28" each.

*2nd Stage* : Bend the longer into circle and make two loops at the end to hook them together with a plier.

*3rd Stage* : The other three pieces are bent in a semi-circle with loops at ends. And the ends of semi-circular wires are fixed into the circle at equal distances as shown in figure 85.

Fig. 85



*4th Stage* : The tops of semi-circular wires are fixed in position with a thin binding wire. This will be the frame for food-cover.

*5th Stage* : Now a piece of mosquito net of suitable size is spread over the frame and cut into the size in circle keeping 1" spare for stitched round the bottom.

*6th Stage* : The piece is spread and stitched round the base.

*7th Stage* : Even stitches are given to each semi-circular wire to hold the net cloth in position.



Fig. 86

Food cover is ready as shown in fig. 86.

NOTE : If wire is not available the frame could be easily made by taking flexible bamboo strips. A small mosquito curtain for being used by a child could also be made as described above on a rectangular base frame.

Necessity of keeping food safe from flies and other insects and how to get rid of these germ carriers can be explained to children in connection with health and hygiene.

### 53. Flower Vase (tin)

Empty talcum boxes made of card-board, metal or plastic are generally thrown away or are not put to proper use. One made of card-board may be used as flower vases for artificial flowers and those of metal or plastic can be used for natural flowers as we can fill water in them.

*Tools and materials required .*

1. Empty talcum boxes.
2. Some coloured picture cuttings from newspapers and magazines.
3. A knife or a razor blade.
- 4 Sealing-wax.

*Method :*

*1st Stage :* The top of the box is removed and labels and painted designs are scraped off with a knife out of coloured picture cuttings.

*2nd Stage :* Some decorations are selected and they are pasted to get attractive designs as shown in figure 87.

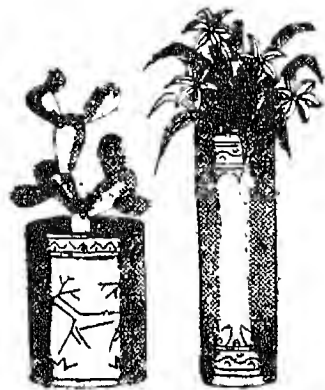


Fig 87

Fig 88

Another method will be to cut the container into two, lengthwise, without removing the top. The punched holes may be sealed with sealing-wax. The two cut portions will appear like boats. To give them a stable position, it is necessary to flatten the basis. This boat-like flower-vase should be decorated by pasting picture cuttings. This type of vases could be used as pen racks.

Some short round tins could be mounted on properly shaped bamboo base with a knot and decorating bamboo base and the round tin as shown in figure 88.

### 54. Feathers Fan

Collecting feathers is an interesting hobby. Feathers are obtained in various colour combinations and at the same time in various designs. They could be profitably used for making of fans and for decoration. Birds made with feathers and clay give realistic appearance. Making of feather brooms for dusting the costly articles in the drawing rooms and for applying ointments, etc., is commonly in use. Formerly they were used as quills. In the remotest tribal areas feathers are still used in making of different garments.

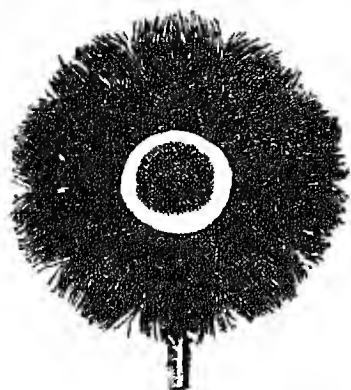


Fig. 89

*Tools and materials required :*

1. Peacock feathers.
2. Two pieces of card-board.
3. Piece of bamboo.
4. Thread.
5. Needle.
6. Scissors.

*Method :*

*1st Stage :* About 20 feathers are cut to 6" in length.

*2nd Stage :* Two discs of card-board measuring 7" diameter and the other of 4" in diameter are cut out.

*3rd Stage :* Feathers are then pasted with glue on the bigger disc in a circular way. They are pasted in such a way that they overlap one another half way.

*4th Stage :* Second similar disc is then taken to be pasted on it so that all the stems come under it. To make it still strengthy a few stitches may be given to join both the discs with thread and needle.

*5th Stage :* A bamboo strip measuring  $9" \times 1" \times \frac{1}{2}"$  is taken and a slit is made in it about 3" in length through one end.

*6th Stage :* The card-board discs are inserted through the slit.

*7th Stage :* Fan may be fixed fairly in the slit with the help of a little binding wire.

*8th Stage :* Sand-papering and polishing is done to make the handle attractive. Some sort of painting may be added to the card-board disc for beautifying it.

## 55. Brush Making

There are various types of brushes for various uses. Brushes are required for scraping floors, cleaning basins, china utensils, glass-ware and for dusting of clothes and painting or white-washing purposes. These are prepared from various types of bristles, animals hair, bird feathers. Animal hair can be collected from the slaughter-houses, dead animals, like horses, buffalos, wild bears and hogs, etc. Fibres of vegetables also serve the purpose.

### 56. Brush for Clothes

There are mainly two methods of preparing brushes : (i) Gluing the bristles. (2) Tying bristles with a binding wire. Here we shall describe a brush for clothes.

*Tools and materials required :*

1. Animal hair.
2. Two pieces of scrap wood.

3. Drilling machine.
4. Thin binding wire.
5. A pair of scissors.

**Method :**

1st Stage . Two planks of 'diar' wood measuring  $9'' \times 2\frac{1}{2}'' \times 1\frac{1}{2}''$  and  $5'' \times 2\frac{1}{2}'' \times \frac{1}{2}''$  are taken. The pieces are shaped as shown in diagram 90 and 91.

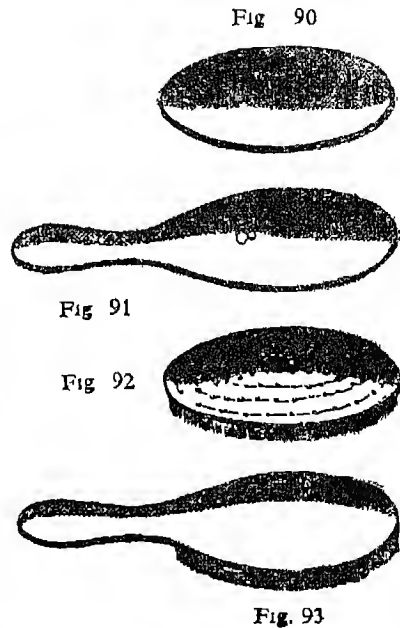
**2nd Stage :** Thin holes are drilled into the piece 'B'  $\frac{1}{4}$ " apart as shown in the diagram. Holes thus drilled should be slightly less in diameter than the thickness of the bunch of hair. About 15 lengths of hair are taken together and folded at the centre. The length of the hair used should be between  $1\frac{1}{2}$ " to 2" long.

**3rd Stage** - The wire is then threaded through the loop of folded bunch of hair and bunch is pulled up tightly towards its size leaving wire on the top of the plank. Putting wire through the loops prevents hair from coming out. Similarly the second bunch is inserted through the second hole and fixed with wire as described above. This process should be repeated till all the holes are covered up as shown in figure 92.

**4th Stage :** Handle portion is then put over the wire threaded portion. This could easily be done by nailing four small nails from hair side passing through the handle piece.

*5th Stage :* With a pair of scissors, etc., lengths of hair are then trimmed off to bring them in level.

6th Stage : With a view to give an attractive look, the wooden portion is made smooth with sand-paper and polished thereafter, as shown in figure 93. If desired some coloured designs can also be added on the polished wood.



## 57. Rubber Scrap

Rubber scrap is a good item for collection. Generally rubber articles are thrown away after use, because they are difficult to repair. But to one, who has an insight into things, they are of immense value to him. They can be useful in a number of ways. Scraps generally consist of motor-tubes, bicycle-tubes and tyres. Solid tyres of bicycles and cart and tonga-wheels, orange-soles and inner-tubes, life-water bags, rubber-sheetings, rubber-balls, rubber tyres and many others.

Wherever possible these articles should be repaired by patching with rubber solution. Children can make use of rubber pieces for erasing purposes. One of the pieces from crepe-sole heels as eraser can well be used for such purposes. For emergency purposes, a bicycle tube can be used for storing ice by tying the two openings properly. Similarly this improvised article could be used as a hot-water bag. The solid round tyres of bicycle can be used for physical exercises as chest expanders. After removing rubber from the wire of this type of tyres we can put it to use as corks for bottles. Soles of shoes when become old are repaired by putting nails, to avoid pricking of nails it is better to make use of inner sole cut to the size of foot out of motor-tube.

Rubber sheetings are used as mats for keeping hot containers. Motor tubes are best for making mats for such purposes. Bed-sheetings for children can also be made out of them.

Bicycle tubes can be used as garters or swings for toys. They can be used for packing the interior of the jar lids. Pieces of cycle tubes can be used as grips for tennis and badminton rackets, cricket bats and hockey sticks. Lengthwise strips of bicycle tubes are used for making a catapult and wrist-bands. Many a times pieces of rubber sheets are used as washers for various pumps, as spectacle-cases and small-money-purses, etc., etc.

Cycle and motor tyres also have a number of uses. They could be used as belts for doors and windows and as slippers 'chapals' and rests for almirahs and other costly furniture when cut round and nailed at their bottoms, so that the bottom of the furniture may not be torn away. They can be used as soles for shoes also.

Broken rubber toys are precious wealth if used as moulds for clay and papier mache articles.

### 58. Whistle

It has been seen that children like to imitate cries or sounds of animals and birds. There are whistles available in the market which can produce sounds of different animals and birds. Here is a simple method of making one of the same.

*Tools and materials required :*

1. Used galvanized wire.
2. Rubber strips cut out of cycle tube.
3. A pair of scissors.

*Method :*

*1st Stage :* A strip of rubber measuring 5" long is cut out of cycle tube to two pieces. Bamboo strips measuring 4"× $\frac{1}{4}$ "× $\frac{1}{8}$ " each are then taken. The strip of rubber is placed between two bamboo pieces as shown in the figure. All the three pieces are tied at one end leaving half an inch rubber strip outside. The extra rubber is turned near the

ends and tied together tightly with thread. Rubber strip is on one end of the bamboo piece as shown in figure, and tied with two ends of bamboo strip tightly with a strong thread. The other side of the rubber strip is stitched and turned over the second end of the bamboo pieces and tied with two ends of bamboo strips.

The whistle is ready for use. Varieties of sounds of animals and birds can be produced by blowing through this bamboo whistle. (See figures 94 & 95).

Fig 94

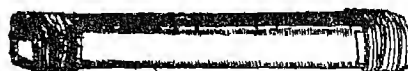
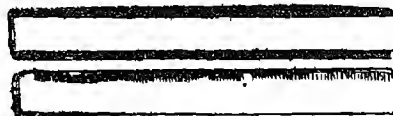


Fig 95

### 59. Skipping Rope

Skipping is a very good physical exercise particularly for girls. It is splendid exercise employing rhythm and grace. It is very easy to make one's own skipping rope. Here we shall describe the same.

*Tools and materials required :*

1. Bamboo pieces 7" in length
2. Rope of one's height—1.
3. Drilling machine.

*Method :*

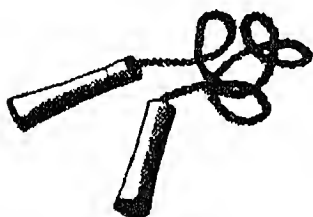


Fig. 96

*1st Stage :* A piece of rope of about 5' in length is procured and two hollow pieces of bamboo of  $\frac{3}{4}$ " diameter and 7" in length are obtained. Each piece should have a knot end.

*2nd Stage :* Two holes are then drilled in the knots of bamboo pieces.

*3rd Stage :* The rope is then threaded through the holes and pulled out and knots are put tightly. The knots are pulled into the handles and the rope will rest against the knots as shown in figure 96.

Rope if not available could be made from the rope-making device.\* It will look attractive if coloured rope is made use of.

*4th Stage :* After the skipping rope is complete, scrap the handles with sand-paper and polish with spirit polish or some paints to make the skipping rope very attractive.

### 60. Fruit Plate

Used gramophone records generally find to place and are ultimately thrown away as waste. It may be pointed out that these records if properly utilised can serve very useful purposes. They can be sawned

\*For rope-making devices, see p 33-37 in *Fibre Craft* National Institute of Basic Education, 1958

and drilled and converted to some substance like plasticine putting it in boiling water. They can be given any shape by pressing them on some mould.

*Materials and equipment required :*

1. Enamel basin—1.
2. Gramophone record—1.

*Method :*

**1st Stage :** Gramophone record is put in boiling water for about 5 minutes.

**2nd Stage .** It is then immediately taken out and pressed against the inverted basin being used as mould. While pressing, a piece of cloth should be used to avoid any burns. Direct pressing should be avoided as the record when hot is likely to cause burns.

**3rd Stage :** When the record takes the shape of the basin, it should be removed and soaked in water and the colour print at the centre is scrapped off with the aid of a pen knife.

Fig. 97



Fig. 98



Fig. 99

**4th Stage** The central hole is closed with the ceiling-wax.

**5th Stage :** It is then scrapped with a piece of sand paper. In case these plates are to be utilised as wall decorations as plaques, the hole should not be closed. It should be painted with colour designs. There is nothing wrong in using these plates

as fruit plates even. (See figures 97, 98, and 99).

### 61. Ladies Hand-Bag from Sponge Gourd

There are two types of sponge gourds—one is edible and the other, bitter. The bitter variety is grown widely in villages on trees and hedges. One or two creepers planted and allowed to spread will yield sufficient fruit vegetables which can be used as vegetables or when dried as articles for craft work. Bitter variety is seen growing wildly on trees and dried fruit could be collected and stores for further use.

The upper skin when peeled off gives inner part which is a net work of fibres artistically woven by nature round a triangular length-wise piece. Gourd is soaked in water for a few days. This triangular piece is cut with a knife or a blade. The outer plain portion of sponge gourd will appear as shown in figure 104. It may be noted that the inner portion of the gourd is more artistically woven and hence it will form upper portion of the finished article.





Ice container, Pen-stand,  
Ladies Hand-bag, Shell-  
tree, Water drawing device,  
Paper weight, Pin cushion



Ladies Hand-bag made out of  
sponge gourd (Torai)



*Tools and materials required :*

1. Dried sponge gourds—2.
2. Needle—1.
3. Thread reel.
4. Knife—1.

*Method :*

*1st Stage :* The gourd is separated from the middle of the same and made plain as indicated in figures 100, 101 and 102. Two such plain portions and two triangular lengths are taken. As the inner portion is more attractive, it is used as the outer part of the article to be made.

*2nd Stage :* Two such portions are kept one over the other and cut into the shape of a bag and stitched carefully with thread and needle.

*3rd Stage :* Two triangular length-wise pieces are then stitched at the mouth of the bag to form the handle. The bag will appear as shown in figure 103 and 104.

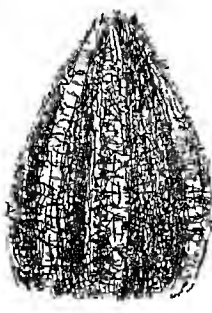
Fig. 100

Fig. 101

Fig. 102

Fig. 103

Fig. 104



*4th Stage :* To make the bag more durable, it is advisable to give a cloth lining to the fibre bag.

This material is generally used as sponge for removing the dirt from the feet, cleaning utensils and articles made out of rubber and plastic. A number of other articles such as birds, animals, etc., can be made out of it. The fibres can be given coloured shades also.

## 62. Cement Paper Weight

Necessity of a number of paper weights is felt everywhere, in schools and offices. The cost of glass paper weights is very high. School children of grade I can make useful and attractive paper weights with a handful of cement. A few moulds will be necessary which could be temporarily procured from homes.

'Katori', water drinking cup, cake-moulds, upper cover of the call-bell or small sized coconut shell, broken celluloid or tin toys can very well serve as moulds. Fused electric bulbs form excellent moulds and paper weights made thereof give natural glazing. (Refer item No. 40).

*Materials required :*

1. Cement.
2. Katori—1.
3. Sand.

*Method :*

**1st Stage :** One part of cement is mixed with two parts of sand. Just a little water is added to make the mixture moist. A little oil should

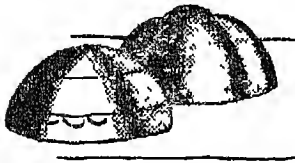


Fig. 105, 106

be applied to the 'katori' and the mixture be then put into the katori and pressed well with the palm of the hand. Extra mixture bulging out of the katori is removed by planing with a piece of wood. The mould is then slowly inserted against a plain surface or a piece of wood and tapped a little

on the top of the mould so that the contents of the mould is loosened. Mould is removed slowly and carefully. A number of paper weights could be made within a little time in this way. Paper weights thus made should be allowed to stand undisturbed for 24 hours for settling of the cement. Afterwards they should be carefully removed and put in water for settling permanently. After a week they are allowed to dry well. It has been observed that one can make about 40 medium sized cement paper weights in one seer of cement. Taking for granted that a school spends -[3]- annas for one seer of cement, it in turn can get 40 paper weights to be used by all teachers.

**NOTE** In every Hindu family 'agarbatti' stands are needed. Paper weights could be used as 'agarbatti' stands, when the cement mixture is detached from the moulds a small hole is made at the centre with a nail. This paper weight with a hole in it will act as 'agarbatti' stand as well.

These paper weights can be painted and designed so as to make them attractive.

Addition of earthen colours to cement, will make coloured cement paper weights as shown in figures 105 and 106.

### 63. Polish and Polishing

Finishing of an article made of wood or bamboo plays an important factor. Unless an article is finished and polished, it does not give an

attractive appearance nor it would fetch satisfactory price. Knowledge of making polish and that of using polish are very important in any craft work.

There are several kinds of polishes each having its own method of application. Here we shall describe two types of polishes only.

#### *French-polish :*

This can be purchased ready-made. But in case it is required to be made at home, it is possible to do so at very less cost. The recipe is given as follows :

Methylated spirit bottle	24 ounces.
Shellac	1 chhatank
Roomi-mastagi	$\frac{1}{2}$ chhatank.

Convert all these ingredients into powder and put them in the spirit bottle. Cork the bottle and allow it to remain in the sun for three days. During this time all the ingredients will be dissolved. The liquid thus formed is called "French polish".

#### *Polishing :*

In all kinds of polishing, the first and the most important operation is the preparation of the surface. The article to be polished should be perfectly dried. Its surface should be quite smoothed and free from any holes or slits. Holes if any be filled with prepared 'stopping'. A good stopping can be made with French chalk mixed in gum. Yellow clay (or "multani mitti") obtainable in the market for white-washing can be used with gum for 'stopping' purposes. When the 'stopping' is completely dried it is cleaned off with sand-paper.

French-polish is usually considered as beyond the capacities of the children, but it is not so. Even with an ordinary care children can produce best results. For a practice in the beginning, school furniture should be given to be polished by the school children.

#### *Application of the polish :*

The first thing is something to rub with, a piece of thin cloth, old piece from dhoti or sari and cotton as pad will form a good "gaddi" with which to rub—a little polish be strained through a piece of cloth. Cotton yarn pad is soaked in the polish and a cloth piece is wrapped round the cotton yarn. This forms the rubber for polishing. Before polishing, the extra polish from the rubber should be squeezed out. The rubber is now rubbed over the surface in a circular motion or up and down so that the whole of the surface is covered. Never allow the rubber to stand still, keep it continuously moving.

It is better to do this work in stages. After one operation allow the article to stand in shade till the coat of shellac dries well. If the rubber shows the tendency to stick, a touch of linseed oil will ease it. About 6 to 8 operations will be quite sufficient. When the surface bears a dull gloss the final coating of spiriting off should be done.

Spiriting off consists of rubbing over the work with a pad soaked in a little spirit. The pad is used lightly first and then the pressure is gradually increased. Great care should be taken to use as little of spirit as possible. Many beginners spoil the work in the final stage by using more spirit or allowing the pad to stick.

Linseed oil polishing is an admirable method for school children. Its main advantages over french polishing are its simplicity and leaving of no marks. To obtain a lasting effect polishing work should be spread over a few weeks. After each application, the oil should be rubbed, dried and left for a few days before the next is applied. A soft cloth-pad should be used as rubber. It should be dipped in linseed oil—raw or boiled—and applied to the surface so as to cover it completely.

A number of articles in scraps of wood and bamboo are expected to be made which need polishing in schools. For this, knowledge of polishing is indispensable.

#### 64. Aloe Stem as Cloth Hanger or Hat Stand

Aloe is a plant widely grown in India. Its fibres are used for cordage, newars, twines, fish-nets, etc. Various uses of aloe fibres are described in booklet 'Fibre Craft' published by the National Institute of Basic Education. When the plant is fully grown its stem comes out of the plant and grows to a height of 8' to 12'. It has branches which bear bunches of seeds. The branches are at equal distances and are distributed round the stem. The stem is not used for general purposes. It gets dried and is destroyed soon. This stem can be used profitably. It is to be used as cloth hanger or stand. It is described here.



Fig. 107



Fig. 108

#### *Tools and materials required :*

1. Aloe stem.
2. Fire-wood.
3. Wooden block 12" in diameter and 6" in height.
4. Knife.
5. A chisel.
6. A saw.

#### *Method :*

**1st Stage :** Well matured stem is cut and allowed to dry. Bunches of its seeds at the end of branches are cut out. From the stock of fire-

wood, wooden block is selected and brought to the size of 12" in diameter and 6" in height.

**2nd Stage :** A hole is made at the centre of the block.

**3rd Stage :** The stem is then inserted into the hole of the block in such a way that the lowest branch is 2 feet from the block.

**4th Stage :** The height of the stem should normally be 6' to 8'. When it is completed, some cheap varnish colour should be applied to protect the stem from insects.

**5th Stage :** This small gadget becomes attractive and has a ready sale in the cities as owners of bungalows like this to use it as a lawn-hat-stand. It occupies a very little space and can be placed in some corner of the house. See figures 107 and 108.

## 65. Paper Tree

Making things from waste paper is very simple and yet very interesting for children. It requires no elaborate tools. Better results can be obtained by using good paper. In any case, it is better to make the first attempt with old news-paper or some brown wrapping papers which are clean and not crumbled.

*Tools and materials required :*

1. Single sheet of newspaper—1.
2. Piece of brown paper—1.
3. A pair of scissors—1.

*Method :*

Paper is folded length-wise leaving a margin of about 3". Lines are drawn on it at a distance of  $\frac{1}{2}$ ". It is cut along these lines. See figures 109, 110, 111, 112. One end of this strip is then taken and hole of it is wound against a pencil in a spiral as shown in figure 113. When the winding is complete, the end is glued and pencil removed. The uncut part of the strip will be the

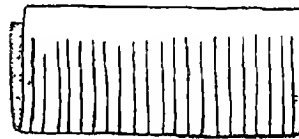


Fig. 109

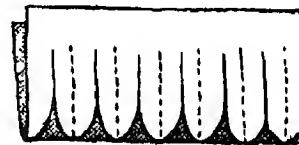


Fig. 110

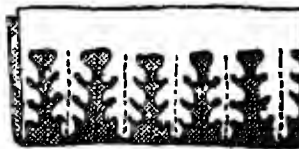


Fig. 111

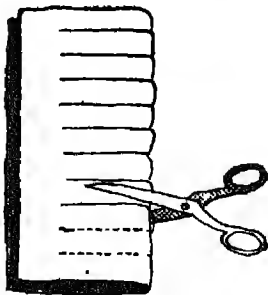


Fig. 112



Fig. 113

trunk of the tree. The cut part of the paper stands out in smaller strip all the way round the tree and hangs down large palm-tree leaves. The shapes of the leaves could be varied in a number of ways as demonstrated in figures 114, 115, 116, and 117.

You can now fix the tree on any stand. A broken bottle or small tin-container will serve the purpose. Some sand is put into the container for holding the trunk of the tree.



Fig. 114



Fig. 115



Fig. 116



Fig. 117

### 66. Leaf Impression

Often, we see that one of the characteristics of a child is to collect stamps, leaves and coins, etc. This natural trait can be put to good use by collecting or making impressions of leaves of trees, for they will be of still great value to the child when he knows the kinds of trees in the locality.

The usual method of collecting leaves is to press them and stick them into a book where after a while they become shrivelled up beyond recognition. For children the following method will be simple and useful :—

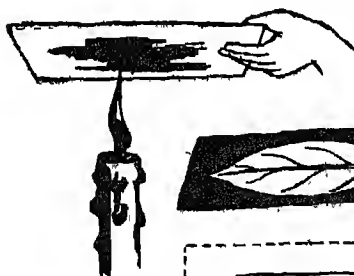


Fig. 118

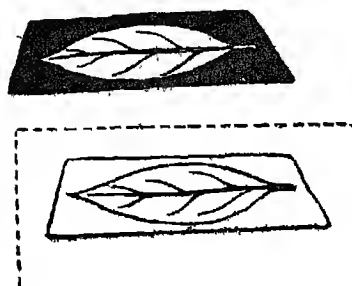


Fig. 119

#### *Materials required :*

1. Brown paper.
2. Candle.
3. Note-book.

#### *Method :*

*1st Stage :* A piece of brown paper is held over a lighted candle, until it is well covered with 'soot' (thread) being careful to move the paper so that it does not burn (See figure 118).

On this blackened surface, a leaf is placed keeping vein sides downwards (older leaves are better than younger ones, as their veins are firmer).

*2nd Stage :* The leaf is covered with a piece of newspaper and rubbed firmly all over, but particularly round its outline. The effect



of this is that the 'soot' will stick to the veins and the edge line of the leaf.

**3rd Stage :** The newspaper is removed and the leaf is lifted by its stock carefully and it is replaced vein side downward, on the white page of the book on which the impressions are to be kept.

**4th Stage :** A clean piece of paper is taken and put over the leaf and rubbed as before, being very carefully not to let the leaf slip. The leaf is removed when a perfect impression of a skeleton leaf will be formed as shown in figure 119. Carbon-paper can be used instead.

**NOTE :** Children may be asked to write down the name of the tree below the impression. Impression of leave of common trees in the locality may be taken.

### 67. Making of Ink

Ink is a useful item in every school. Considerable quantity of ink is required annually. It could be made in schools by utilising thrown away mango-stones. If they are collected in large quantities sufficient ink for the use of school could be made and stored. During the harvest season mango-stones are collected and dried. Another item necessary for making the ink is rusted iron pieces. Out of iron scraps these pieces could be collected and exposed to rains for a month or so till they are rusted.

*Materials and equipments required :*

1. Mango-stones.
2. Iron kettle.
3. Rusted iron pieces.

*Method :*

Kernels are removed out of mango-stones and they are powdered. Sufficient quantity of water is taken in an iron kettle and the powder is added. The rusted iron pieces are also added. Ingredients are boiled for a considerable time till the blue ink of desired consistency is obtained. The solution is then strained through the cloth and bottled. Addition of little iron sulphate will improve the colour and make strength still more.

Blue-black writing ink from Myrobalans "Harra".

Myrobalans are available in plenty in many areas. These could be utilised to prepare writing ink required for annual consumption for every school. Making of ink out of myrobalans which are waste will be profitable experiment to be done in schools. Schools will be able to provide ink not only for themselves but for others too. Expenses could be met from school contingencies in the beginning and recovered from sale proceeds thereafter.

*Materials required :*

1. Myrobalans.
2. Ferrous sulphate.
3. Gum.
4. Hydrochloric acid.
5. Phenol
6. Dye (ink blue A.S. and ink blue D.)
7. Water.

*Method :*

*1st Stage :* Selected myrobalans are dried and crushed to small pieces.

*2nd Stage :* They are steeped in water about four times the weight of myrobalans and heated to boiling stage for four hours and allowed to settle overnight.

*3rd Stage :* The tennins is dissolved in water and this extract is decanted through a thick cloth. One pound of myrobalans will give 3 ounces of tennin.

*4th Stage :* Ferrous sulphate crystals 3 ounces and gum weighing 3 ounces are the undissolved separately in water and added to the tennin extract.

*5th Stage :* Hydrochloric acid  $\frac{1}{2}$  ounce in weight is then added and the whole lot is placed aside for ten days after which it is filtered through a thick cloth. Blue dye solution (dye-2 ounces and phenol  $\frac{1}{2}$  ounce is added). To this then 14 pounds of water is added and the ink is stored in bottles.

NOTE : Old earthen jars should be used for all purposes mentioned above. Old jars are improvised before use.

## 68. Nature Craft

Nature craft is the name given to the making or decorating various articles with natural objects of the country-side such as, nut shells, grasses and seeds, etc., etc.

It is a handicraft in which considerable ingenuity can be exercised. It is quite indispensable. It can excite quite a good fun and interest. It may be pointed out that it is no craft in true sense and should be recognised more as a means of producing novelty articles than as a craft. In the elementary grades, any seeds can be used profusely as teaching aids to teach additions, subtraction, and multiplication etc., etc. Children can be seen collecting tamarind seeds and playing the game "give and take". This naturally gives them the idea of mathematical calculations. The seeds generally used are of apple, tamarind, tandu, bel, orange, wall-nuts, apricote, dates, chhind, almonds, sapote (chikku), rudraksha, etc.

The seeds of various colours and sizes should be sorted out to be used at the proper places in clay models. Seeds can be inlaid beautifully in clay plates. They can be used in preparing garments. Holes can be made by drilling. A wire can be put through these seeds and set to make animal or bird shapes as shown in figures 120 and 121. Date seeds can be used for making link buttons. Seeds can be inlaid beautifully in clay-plates. Feathers of birds may be used in combination with seeds for preparing clay toys.



Fig 120



Fig. 121

### 69. Bel Fruit's Tobacco Box

It has been seen in tribal areas that dried bel fruit is used as a tobacco or the snuff box.

*Materials required :*

1. Bel fruit.
2. A piece of wire.

*Method :*

*1st Stage :* Dried bel fruit of small size is taken. A hole is drilled at the top.

*2nd Stage :* The inside pulpy portion is scooped out completely with a piece of wire.

*3rd Stage :* Now it is filled with water and kept for a few days so that complete removal of remaining fleshy material gets easier.



Fig. 122

*4th Stage :* It is then thoroughly dried in sun. A small wooden piece can be used as cork.

*5th Stage :* It is then corked with a small piece of wood.

*6th Stage :* A little edible oil is applied to the bel fruit from outside and kept in kitchen where it takes black colour. It may be polished with lacker polish if so desired. This sort of box is commonly used to store tobacco or snuff, (See figure 122).

In the same way a bird is made out of seeds and feathers which can be seen in figure 120 and 121.

## ART AND ARTISTIC ARTICLES

*Wood shaving pictures :*

Very fine pictures can be made out of different types and shapes of wood-shavings by pasting them in different patterns and afterwards colouring them with ordinary water colours. These wood shavings can be easily collected by the children of all grades either from the wood-work section of the school or from the nearby local carpenters' shop. These may be stored in some small card-board box and may be used whenever required. Some of the examples of pictures which can be made out of these wood shavings are given below .

**70. Flower Picture***Materials required :*

1. Wood shaving.
2. Tillis (Reeds).
3. A white or coloured sheet of paper of any thickness.
4. Flour paste.

*Method :*

*1st Stage :* First of all a plain white or coloured sheet of paper is taken and with pencil or a piece of charcoal stick or crayon a simple flower pattern with two or three flowers is made.

*2nd Stage :* Now from a base of different types of wood shaving a particular size and type of wood shavings which may suit the design

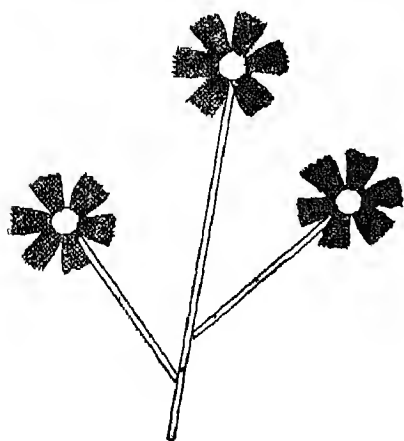


Fig. 123

are selected and kept aside. Afterwards the paste is applied over the drawing and wood shavings are pasted to show the petals of the flowers. These shavings can also be coloured in the ordinary water colours to add more charm to the design.

*3rd Stage :* To make the stems of flowers tillis are pasted with the flour paste. Instead of tillis some coloured stings or particular type of the round wood shavings can be pasted and afterwards coloured. In this manner different types of flower patterns can be made out of different types of wood shavings (Fig 123).

**71. Walking Man***Materials required :*

1. Spiral type wood shavings.
2. White or any coloured sheet of paper.
3. Tillis. (Reeds)
4. Flour paste.

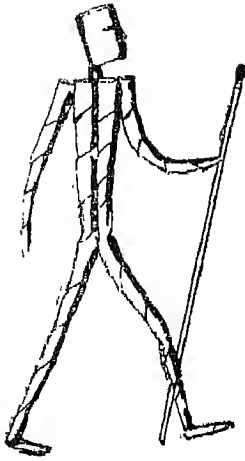
*Method :*

Fig 124

*1st Stage* · First of all a rough line drawing of a walking man is made in a sheet of plain or coloured paper. There is no need to show any details in the figure.

*2nd Stage* · Now a thin layer of the paste is applied upon the outline and different pieces of spiral like wood shavings are pasted keeping in view the proportion and thickness of the different parts of the body. To show the staff in the man's hand a piece of tili is pasted there with the flour paste. (Fig. 124) A few touches of colour may be given here and there if found necessary. In this way we will get an attractive picture of a walking man with three dimensional effect.

**72. Bird***Materials required :*

- 1 Thin round wood shavings.
2. Burnt match sticks.
3. A round piece of card-board or some bottle cap.
- 4 A white or coloured sheet of paper.
5. Flour paste.

*Method :*

*1st Stage* : To make a bird out of wood shavings, first a drawing of any type of bird is made upon a plan sheet of white or coloured paper with some pencil or charcoal or crayon. Drawing should be simple and there is no need of any details to be shown in the drawing.

*2nd Stage* : Afterwards thin round type of wood shavings are selected and kept aside for pasting them over the drawing. Flour paste may be applied with finger tip or with some small old used brush and wood shavings are pasted one by one keeping in view the shape of the bird to be made. Now for making the head a small round piece of card-board may be pasted there or if any bottle cap is available then it may be pasted there to make it look more attractive. Now burnt match sticks may be pasted to show the legs of the birds:

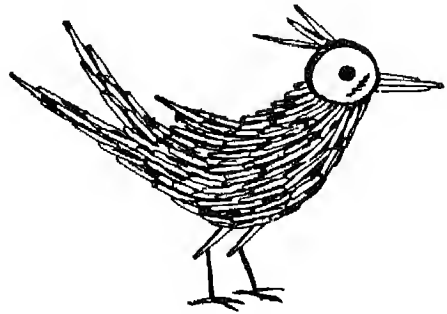


Fig 125

**3rd Stage :** Now when all the pasting work is complete a few touches of some water colour may be applied upon the wings body and legs to give it a more realistic look (Fig. 125). In this manner different types of birds and animal forms can be made out of these wood shavings

### 73. Girraff

*Materials required :*

- 1 Thin elongated type wood shavings.
- 2 White or coloured sheet of paper.
3. Paste.
4. Water colours.

*Method :*

On a plain sheet of paper a drawing of girraff or any other such animal of child's interest is made. Drawing should be simple and without any details. Afterwards paste is applied and elongated types of wood shavings are pasted side by side. In this manner entire figure is covered with wood shavings. A few touches of colour here and there will add charm to the figure of the animals. This way a number of animal shapes can be prepared out of wood shavings.

### 74. Sceneries

*Materials required :*

1. Different types of wood shavings.
2. Sheet of coloured papers.
3. Paste.
4. Water colours.

*Method :*

On a coloured or plain sheet of paper a drawing of an out door scene is made with a piece of pencil (Fig. 126) For making these types of pictures variety of wood showing with different shapes and colours should be collected and kept ready for use. Now elongated shaped dark coloured wood shavings are pasted in the trunk of the tree. Small curl shaped wood shaving may be pasted in the place of leaves and to show grass or other such thing straight and long type wood shavings may be pasted in the place of mountains, huts and figures All this pasting work should be done with flour paste and when it is over, a few colour touches may be applied



Fig 126

wherever required. In this way a number of varied scenery can be prepared out of wood shaving which not only gives texture but a relief effect to such composition.

### 75. Tailor's Cutting Pictures

Coloured emry paper has been used by children as well as grown ups for making pictures by tearing, cutting and pasting them on a plain or coloured paper. But very interesting and beautiful pictures can be made out of tailors cloth cuttings by cutting and pasting them in required shapes. Cloth cuttings can easily be collected by students from the tailor's shops without spending a single pie. They are usually available in different shades of colours. These cuttings may be collected and stored in a card-board box and may be used from time to time when the need arises. Apart from tailor's cutting and other material required for making pictures is paste and some white coloured sheets of paper on which these cuttings are to be pasted.

#### *Method :*

First of all a simple composition is drawn on a white or coloured sheet of paper without any minute details. Now different types of coloured cloth cuttings are selected according to the colour scheme of the picture and kept aside. These cloth cuttings will be used instead of colours for the picture. Before pasting them on the paper they are first cut according to the shape and size of the picture. Now paste is applied over the drawing and these cut out shapes of cloth are pasted one by one. In this manner different types of compositions can be prepared out of cloth cuttings. (See Figure 128).



Fig 127

### 76. Coloured Paper Mosaics

For paper tearing and pasting work which is generally being practised in schools, a costly emry paper is used. This paper has shining coloured surface on one side and plain white on the other side. Being quite costly many schools cannot afford to make use of it for art work. In that case coloured pictures taken out from old magazine can be used for paper tearing and pasting work. These pictures are quite inexpensive and they can be collected by the students and put to use whenever the need arises.

#### *Materials required :*

1. White paper.
2. Coloured magazine pictures.
3. Flour paste or gum.

*Method :*

On a white sheet of paper any drawing from imagination is made with pencil or crayon. After completing the drawing different coloured



Fig 128

more interesting types of mosaic pictures. (See Figure 129)

portion are torn from the coloured magazine pictures and are pasted in small bits with paste or gum. Before painting these coloured papers, the colour scheme of picture is already thought out and small bits of coloured pictures are pasted accordingly. In this manner one will get beautiful mosaic picture made out of coloured magazine papers. Fibres cords and cloth cuttings can also be pasted along with these bits of coloured pictures in making

**77. Bamboo and Egg Doll***Materials required :*

1. Empty egg shell.
2. Piece of bamboo.
- 3 Coloured pictures.
4. Paste.

*Method :*

First of all a waste piece of bamboo about 4" in height is taken. Now on one side of it an empty egg shell is kept and pasted nicely with a piece of thin paper so that it cannot be easily separated from the bamboo. A piece of card-board is nailed at the other end of the bamboo so that it can properly stand on this base. Now a piece of coloured magazine picture is taken and is folded and pasted at the centre of the bamboo in such a manner so that it may take the shape of a skirt. Now another piece of coloured magazine picture is taken and is cut, folded and afterwards pasted at the neck of the doll so that it can cover the upper portion also (Fig. 129). For making the hair of the doll, coloured fibres or coloured cotton or some coloured waste piece of cloth or paper is pasted. When the pasting work is complete, eyes, nose and lips may be painted with water colours. This will make the doll complete.



Fig 129



## 78. Paper Horse

### *Materials required :*

1. News papers.
2. Coloured magazine pictures.
3. Flour paste.
4. Thread.

### *Method :*

To make a horse or any other animal out of news papers, first of all news papers are rolled out in the shape of cylinders. For the face, neck and body of a horse one such thin and long roll is made and tied with cotton thread so that it may remain intact and do not get loose. Similarly two more rolls of news papers are made for fore and hind legs. They should also be tied with cotton thread so that they may not get loose. Now first roll AB is given a little bent. Thread can also be used to keep the position of head and neck of the horse. Now another roll is taken, folded and tied with thread to make the fore legs. Similarly hind legs are made from another roll and are tied. For making a tail of the horse some white or black coloured fibres are inserted at the end of the roll. Some more news papers may be rolled round the stomach to give it a proper shape.



Fig 130

Now flour paste may be applied all over the body and small bits of news papers are pasted one by one. When one layer of papers is over, paste is applied again all over the body and second layer of papers is then pasted. In this manner after giving six or seven layers of papers, one more layer of small piece of some coloured magazine pictures is then pasted to make it look finished and more attractive. In this manner different animal shapes can be made out of news papers.

## 79. Paper Bag Doll

### *Materials required .*

1. Empty packing paper bags
2. News papers.
3. Coloured thread.
4. Coloured magazine pictures.

### *Method :*

.- Paper bags which are generally thrown away after use may be collected and utilized for art work. For making a paper bag doll one such type of a small paper bag is taken. Now out of old news papers a small ball type thing is prepared and inserted inside the paper bag and a coloured thread is tied at the centre of the bag.



Fig 131

Now eyes, nose and lips of the doll may be painted with water colour and some sort of head dress of some coloured magazine picture may be given to it (Fig. 131).

## 80. Paper Doll

### *Materials required :*

1. Waste pieces of thick, stiff paper.
2. Paste of flour (maida) and
3. Pair of scissors.

For making this type of paper sculpture a little thick or stiff type of waste paper will be more suitable because the sculpture made of waste paper of ordinary thickness might not stand firmly and last longer.

### *Method :*

**1st Stage :** A piece of paper is taken and a cylinder 4" long with a diameter of about 2" is made out of it. This cylinder will serve as the body of the figure. In the same way two cylinders 5" long and with a diameter of about 1" are made for the legs.

**2nd Stage :** Both these leg-cylinders are inserted in the body and pasted in such a way that the model can stand properly.

**3rd Stage :** Two more cylinders  $4\frac{1}{2}$ " long and with a diameter of  $\frac{3}{4}$ " are made out of the same paper for the arms. Two hands are made out of these cylinders by cutting 1" of them in the shape of hands as shown in figure 132.



Fig. 132

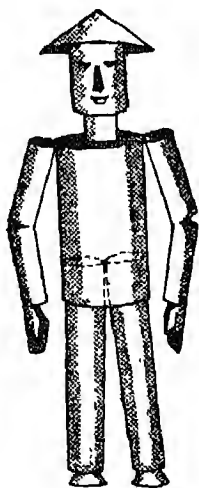


Fig 133

Now both these are pasted with the body cylinder with a piece of thick paper and are half cut at the elbows for the purpose of bending arms and allowing them to have a free movement.

**4th Stage :** For the head, cylinder 2" long and of  $1\frac{1}{4}$ " in diameter is made and pasted with a piece of thick stiff paper at the centre of the body.

**5th Stage :** Eyes, nose and lips are made by cutting away those pieces with paper with some blade or small scissors. (See Figure 135).

## 81. Dog

*Materials required :*

1. Used galvanized wire.
2. Waste newspaper.
3. Thread.
- 4 Paste.
5. Moonj.
6. Powder colours

*Method :*

*1st Stage :* First of all the shape of a dog is drawn on any piece of paper or on the floor with a pencil or chalk.

*2nd Stage :* Then the piece of thin galvanized wire is taken and is bent along the shape drawn

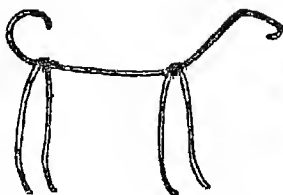


Fig 134

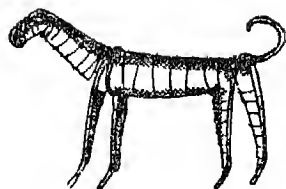


Fig 135

on the paper or floor. The full shape of this animal is not made out from only one wire. For legs different pieces of galvanized wire are used and they are tied with the main back-bone wire with a piece of thread or with thin wire as shown in figure 134. This skeleton of the dog is made to stand properly on its legs and is observed from different angles and if there is fold with the wire skeleton it is removed by bending the wires accordingly.



Fig 136



Fig 137

*3rd Stage :* Some pieces of waste papers are taken and rolled properly and then tied to the different types of the body with some thread keeping in view the actual shape of the living dog as shown in figure 135.

*4th Stage :* The paste is then applied all over the body and small pieces of waste paper are pasted one after another. This way after completing the first layer, the paste is applied again and the pieces are pasted in the same position. In this way about 7 to 10 layers of papers are pasted till a satisfactory shape of the dog is obtained as shown in figure 136.

*5th Stage :* It is then kept in some shady place to dry completely. It should never be dried in the sun to avoid irregular shrinkage.

**6th Stage :** It can be coloured according to one's choice with water or oil paint. If the dog is to look more realistic, colouring is not needed.

**7th Stage :** One coating of paste is applied all over the body and tiny bits of 'moonj', 'fibre' cut with scissors are pasted all over the body. If required a coat of black or brown colour is needed as shown in figure 137.

In this way we can easily make different shapes of animals.

Children should be allowed to go their own way in shaping, colouring or decorating their own production, of course with some limitations, so that it helps them in getting identified with their creation.

## 82. Fancy Doll

A beautiful fancy doll can be prepared out of a dry sponge-gourd which is easily available in rural as well as urban areas. It costs practically nothing and with a little imagination artistic shapes of animal and human being could be prepared out of it.

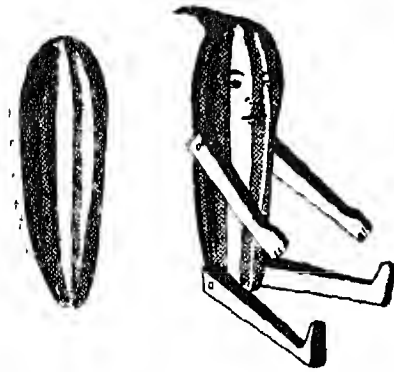


Fig. 138

Fig. 139

### Materials required :

1. Dry sponge-gourd.
2. Pieces of waste wooden strips.
3. 'Moonj' fibres
4. Thin binding wire.
5. Painting materials including brush No. 1

### Method :

**1st Stage** To make a doll, as shown in figure 138, a dry sponge-gourd is taken.

The broader side of it will serve as the head of the doll and the thinner side as the body of it.

**2nd Stage** Two wooden strips  $1'' \times 5'' \times 1\frac{1}{2}''$  are taken and shaped like legs with a file.

**3rd Stage** Two holes in the lower portion of the sponge-gourd are made with some thick needle or some instrument with a piece of thin wire.

**4th Stage** Both the legs are tied properly to both sides of the sponge-gourd. In the same way two arms of the doll are made out of 2 wooden strips measuring  $4'' \times 2\frac{3}{4}'' \times \frac{1}{4}''$ .

**5th Stage** Two holes are made in the centre of the gourd. The arms are tied with a piece of wire in such a way that both the arms can easily move up and down.

**6th Stage** In the upper broader portion of the gourd, eyes, nose, lips and ears are painted.

**7th Stage :** On the top of the gourd fibres are pasted and coloured black in such a way that they look like hair as shown in figure 139. Thus the doll will be ready for playing.

### 83. Horse

Every material has got its own limitations. So is the case with the use of grass, 'tillis', for making pictorial compositions. 'Because 'tillis' cannot be bent in round shapes and forms, they can be best utilised only in making such compositions which are not realistic but more or less extra patterns or drawings with straight lines.

**Materials required :**

1. Piece of thick waste card-board or paper.
2. Grass 'tillis' (Thin reeds).
3. Flour.
4. Pieces of coloured paper or cloth.

**Method :**

**1st Stage :** Take a piece of waste coloured thick packing paper or card-board and make a simple drawing with a piece of chalk or pencil in simple straight lines.

**2nd Stage :** Then 'tillis' are cut according to the shape of the figure and pasted on it with flour-paste

**3rd Stage :** After that some piece of coloured paper or cloth are pasted here and there for making the whole thing look more attractive as shown in figure 140. In this figure the simple shape of a horse is made by pasting grass 'tillis' (thin reeds) and pieces of

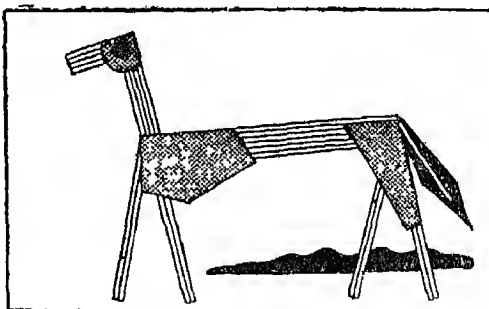


Fig. 140

coloured paper here and there to bring out the shape of a horse. This is how many other compositions can be executed by utilising 'tillis', coloured pieces of paper or cloth, etc.

### 84. Wooden Doll

**Materials required :**

1. Waste piece of packing-case wood.
2. Cap or a lid of a bottle.
3. Screws.
4. A piece of card-board.

**Method :**

**1st Stage :** For making a doll out of waste packing-cases wood, a piece of wood measuring  $\frac{1}{4}'' \times 3'' \times 6''$  is taken. Again two other pieces,

of wood measuring about  $1\frac{1}{3}'' \times \frac{1}{4}'' \times 5''$  each are taken and both of them screwed to the ends of the above-mentioned square piece of wood. Both the pieces will serve as the legs of the doll.



Fig 141

**2nd Stage :** For making arms two more pieces of waste wood measuring  $\frac{1}{4}'' \times \frac{1}{4}'' \times 5''$  each are taken and screwed to the upper portion of the body leaving 2" piece for the body.

**3rd Stage :** For making the hat of the doll a piece of thick card-board and metallic small bottle cap nailed together will make nice hat which again is nailed to the top of the central square piece of wood.

**4th Stage :** Two small pieces of wood are nailed up for making the feet of the doll. Afterwards the doll is placed on some thick piece of wood about  $5\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1''$  and nailed together so that it may not fall down.

**5th Stage :** When the wooden doll is ready it is painted with oil or water colour according to one's taste giving it colours for clothes, hat and shoes, etc. as shown in figure 141.

## 85. Baby Doll

**Materials required :**

1. Empty egg-shell
2. Small empty bottle or a cream bottle.
3. Coloured pieces of paper.

**Method :**

**1st Stage :** For making a baby doll one egg shell and a small empty bottle such as cream bottle which has broad neck is taken. First of all the shell is placed upon the neck of the bottle and pasted with a piece of thin waste paper so that the shell may stick properly to the bottle.



Fig. 142



Fig. 143

**2nd Stage :** Then two pieces of waste card-board or box-board are taken and are rolled in the form of two legs and are pasted at the bottom of the bottle.

**3rd Stage :** Similarly two arms are rolled out from the same thin card or box-board and pasted on the upper part of the bottle as shown in figures 142 and 143.

**4th Stage :** When dry it is clothed with different pieces of coloured papers taken out from magazines or pieces of cloth taken from tailors'

shops. We may, however, use a variety of materials and colours to give the doll a good and attractive look.

### 86. Straw Doll

Very good and fascinating dolls are prepared out of husks, coloured strips and used pieces of coloured cloth. Here we shall describe one

#### *Materials required :*

1. Straw
2. Used Galvanized wire
3. Coloured strings and cards.
4. Used pieces of coloured cloth.

#### *Method :*

**1st Stage :** First of all a piece of galvanized wire which can easily be bent is taken and a skeleton of some human figure, animal or a doll is made out of it by using the separate pieces of galvanized wire for the body. Legs and arms are tied together with a piece of thread as shown in figure 144.



Fig. 144



Fig. 145



Fig 146

**2nd Stage :** Some moonj straws equal to the length of the full figure starting from the end of leg reaching up to the top of the head are taken and are tied at the bottom of the leg and another at the waist with the same string. Similarly the same quantity of husks are tied for the second leg also. So is done for the arms of the doll. For wrists and chest some more husk is added as shown in figure 145.

**3rd Stage :** Coloured pieces of waste cloth, strings and cards etc., are utilised for clothing the doll as shown in figure 146. Bright red coloured card is utilised for making the frock of the doll and a green coloured strip of waste cloth for preparing its 'skirt' (choli). Coloured strings are tied at the neck, at wrist and at ankle to beautify further the appearance of the straw doll. If one wants to make his doll look like a male figure, then the pieces of strings and cloths are wrapped according to the requirements of the male figure.

**4th Stage :** Now when the doll is complete a piece of wood, which will serve as the pedestal of the figure is taken and two holes are made into it. Both the legs of the doll are inserted in it in such a way that the doll can stand properly. Pedestal is also painted with some suitable water or oil colour paint. In this way other figures can also be prepared out of straw or husk.

The purpose of these experiments is to guide children to encourage them to unfold their constructive imagination. Every child will like to prepare such dolls for the baby at home.

## 87. Wire Sculpture

*Materials required :*

1. Waste piece of galvanized iron wire.
2. 2"×3"×3" pieces of waste packing-case wood.

Waste galvanized wire can easily be turned to beautiful wire sculpture only by bending them into interesting shapes. The process is not difficult one and is given stage-wise.

*Method :*

*1st Stage :* Before bending the galvanized wire to any shape it is necessary that one should draw the shape of some particular figure



Fig. 147



Fig. 148

*2nd Stage :* This can be made on a slate or floor with pencil or chalk. Drawing should be simple human or animal figure or of some bird. The lines should be in continuity. Otherwise it will be difficult to join 2 or 3 pieces of wire without welding which is a costly affair. It is, therefore, essential to

draw a single flowing line as shown in figure 147.

*3rd Stage :* The wire is bent accordingly with hand keeping it on the drawing with the help of pliers.

*4th Stage :* When the shape is ready it is painted with some oil, enamel or water colour paint according to one's choice to make it attractive.

*5th Stage :* A piece of ordinary waste wood 2"×2"×½" is taken and a hole is made into it with some nail so that it can serve the purpose of stand for that wire sculpture.

*6th Stage :* Then the end 'A' of the sculpture is inserted into the hole so that it can stand properly without any support as shown in figure 148.

In this way by bending only the pieces of waste galvanized wire many interesting shapes can be made and they will serve as the pieces of decoration for class-rooms and homes and may adorn also.

## 88. Bird

Very interesting fancy birds can be made out of ordinary clay and feathers which are generally found lying waste on road sides. Such things can be collected and utilised in some way or the other for



artistic creation with some imagination. Now here we shall describe a bird.

*Materials required :*

1. Various sizes and types of feathers.
2. Clay (white) or ordinary red clay.
3. Thin binding wire.

*Method :*

*1st Stage :* A 4" long coil is prepared out of thin binding wire by turning it on some knitting needle or on any other such thing which has the thickness of the knitting needle.

*2nd Stage :* Some ordinary or white clay is then taken and given the shape of the body of the bird about 3" long by rolling it in both the hands. Head is also made out of the same clay and joined with the body by inserting a 1" long coil in both the lumps.

*3rd Stage :* A small piece of feather stem is then inserted in the head to give it a look of a beak.

*4th Stage :* 2" long coil is then inserted in the centre of the body and at both the ends of the coil. Two small lumps out of the same clay are added as shown in figure 149.

*5th Stage :* Some small good feathers of any bird are then inserted in both the lumps for its wings and at the back of the body for its tail.

This way the whole thing will give an appearance of a flying bird.



Fig. 151

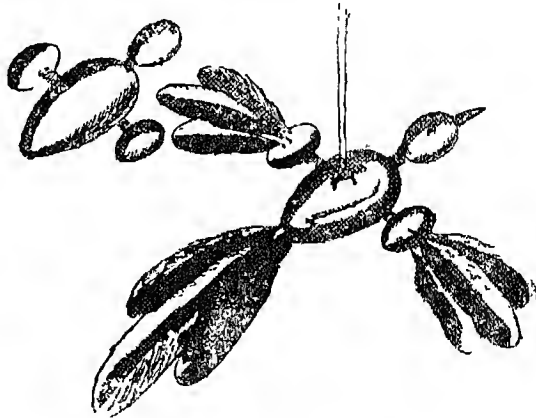


Fig 150

Fig. 149

*6th Stage :* A small hook is prepared out of thin wire and put in the centre of the body of the bird. A thin strip 10" long cut off from a new cycle tube is tied in the hook.

*7th Stage :* After making the eyes and giving a few touches on the body it will make it look more realistic as shown in figure 150. For preparing an ordinary sitting bird a lump of clay is taken and a shape

of the bird is modelled out of it by merely pressing the clay with the

fingers. The wing and the tail are made by inserting some long-sized feathers at the back of the body and some small feathers on the upper portion of it. Beak and legs are made by inserting small pieces of feather stems. Two small red or black pieces of lead can be used for making the eyes of the bird as shown in figure 151.

### 89. Paper & Cloth Pictures

*Materials required :*

1. Either drawing paper and pastel or coloured paper.
2. Coloured pieces of paper collected from newspapers, magazines.
3. Waste coloured pieces of cloth.
4. Flour-paste.
5. Fibres.
6. Coloured cord.



Fig. 152

*Method :*

*1st Stage :* On a sheet of white drawing paper and coloured paper some simple compositions of a figure of a man or woman or some bird or animal is drawn with a pencil or a piece of chalk. Drawing should be so simple that it would contain no details.

*2nd Stage .* Before starting the real work, the colour combination must be thought over and different pieces of paper and cloth which the figure would require are sorted out and the selected colour pieces of paper are torn into small bits.

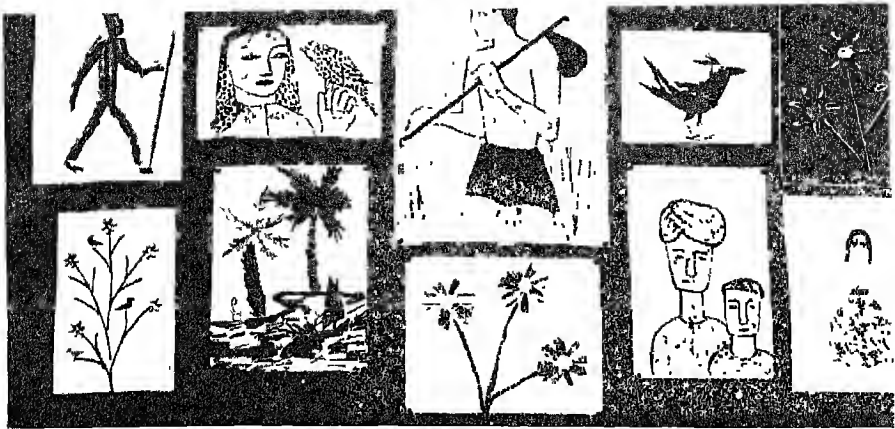
*3rd Stage :* Now the paste is applied portion by portion and pieces of paper and cloth are pasted upon it.

*4th Stage :* Fibres, coloured cords and strings can also be utilised where necessary as shown in figure 152.

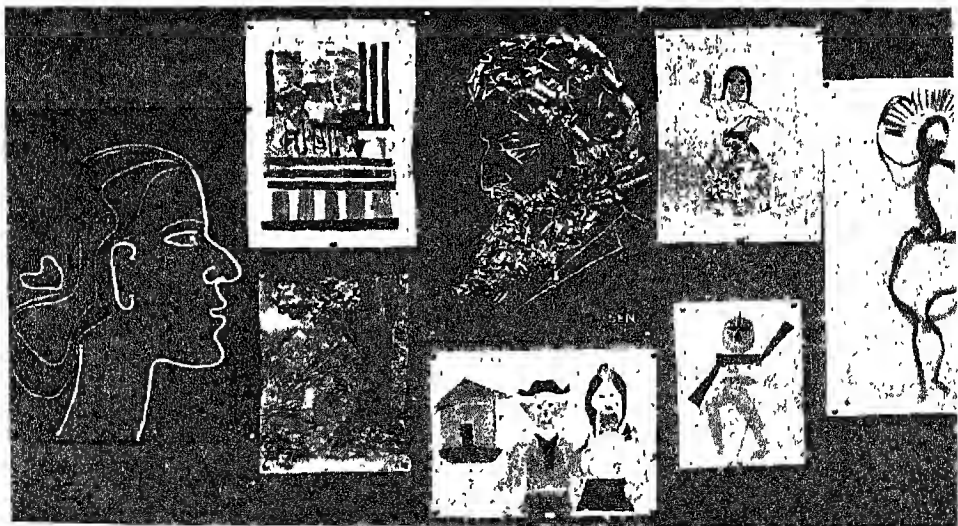
### 90. String and Cord Pictures

*Materials required :*

1. Drawing paper or pastel or coloured paper.
2. Coloured strings or cords
3. Flour-paste.
4. A pair of scissors.



Pictures showing use of Egg shells, Ground-nut, shells, Seeds and tailors' cuttings, Coloured Paper, etc



Pictures showing use of coloured strings, wood shavings, tailors' cutting, Fibres and Magazine Pictures



**Method :**

**1st Stage :** Make a required drawing on drawing paper or pastel or coloured paper with pencil or a piece of chalk. For this purpose, it must be kept in mind that composition should be simple. Interesting head of either a man or a woman or a simple animal form will be more benefiting for this work.

**2nd Stage :** Now some pieces of strings and cords of different colours and a good thickness which are found suitable for the work are selected.

**3rd Stage :** Then flour-paste is applied all along the line of the picture and strings or cords are pasted upon the line. Then we shall get a picture in outlines only. Coloured pieces of cloth and paper can also be utilised to make the work look more attractive. As shown in the figure 153 head of a woman is drawn in profile. For making the face a thick cord of yellow colour is utilised and for hair the black cord of some thickness is pasted. The flower which is stuck in her hair is cord of light red colour.

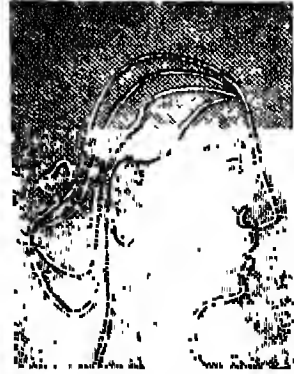


Fig. 153

**91. Spool Toy****Materials required :**

1. Spools.
2. Used thin galvanised wire.
3. Coloured pieces of cloth or crepe paper.
4. Empty cigarette packets.



Fig. 154



Fig. 155



Fig. 156

**Method :**

**1st Stage :** For making such type of toys an empty spool is taken and one 10" long bamboo or a wooden stick of the same measurement is fixed in its hole.

**2nd Stage :** One 9" long used galvanised wire No. 12 is then taken and is bent to give the shape of arms.

**3rd Stage :** The same is then tied with bamboo

stick leaving 1" from the upper end for its head as shown in Figure 154.

*4th Stage* . Then some pieces of waste tissue paper or very thin cloth are taken and tied around the one foot long bamboo stick and that serves the purpose of the face of the doll.

*5th Stage* : Tissue paper of any empty cigarette packet is taken and wrapped round the face for giving it a better finish.

*6th Stage* : A coloured piece of cloth or paper is then tied at the centre of the bamboo stick giving it the shape of a petticoat of the doll as shown in Figure 155.

*7th Stage* : Another piece of coloured cloth or crepe paper is taken and tied at the neck in such a way that it covered the arms and the remaining portion of the body.

*8th Stage* : A small piece of coloured paper or ribbon is pasted around the neck for the better finish.

*9th Stage* : A small piece of box-board from the empty cigarette packet is then taken and is cut to shape of a book.

*10th Stage* : Blue or green coloured paper is then pasted on the back of it and two holes are made in it.

*11th Stage* : Then two ends of the galvanized wire are inserted in the holes so that it appears as if the doll is holding an open book in its hand.

*12th Stage* : Eyes, nose, lips, hair etc., are then painted and the doll is made to stand on the spool as shown in Figure 156.

## 92. Mosaic Pictures

*Materials required :*

1. Egg-shells.
2. Water colours.
3. Pieces of coloured paper.
4. Flour paste.

*Method :*

*1st Stage* : Egg-shell mosaic is very interesting. Beautiful mosaic effect is achieved by pasting small coloured pieces of egg-shells. To start with the work, first of all a piece of coloured paper to use as background for the picture is taken.

*2nd Stage* : Some simple original composition is switched with human or animal figures.

*3rd Stage* : Before breaking egg-shell into small pieces they are given a coat of different colours with the colour paint (water colour) and are

kept in the sun for drying. The egg-shells are coloured according to that colour combination which will be used in that picture. Therefore, the colours which will be used in that picture are first thought out and then those egg-shells are painted accordingly.

**4th Stage :** Before painting the egg-shells they are first put in water and cleaned properly.

**5th Stage .** Afterwards those coloured shells are broken into small pieces.

**6th Stage :** After applying flour paste on the sketch paper those coloured pieces of shells are pasted closely inside the outline sketched for composition keeping in view the colour scheme of the picture. When all the pasting work is complete an outline is given allround in black or brown colour as shown in Figure 157. In this way many original compositions can be executed in egg-shell mosaic pattern.



Fig 157

### 93. Sun Flower



Fig 158

#### *Materials required :*

1. Grass 'tillis'.
2. Ground nut shells.
3. Grey coloured waste paper.
4. Flower paste.

#### *Method :*

**1st Stage :** A piece of dark coloured waste paper or pastel is taken and some simple drawing of sun flower or any other flower is made with a piece of chalk or pencil. It must be always kept in view that the drawing

made should not be complicated in any way and it should be as simple as possible.

**2nd Stage .** Now halves of groundnut shells are taken and pasted on the places of petals of the flower and in the centre of the flower a piece of tin foil cut in round shape out of cigarette packet is pasted.

**3rd Stage :** In the place of stem of the flower grass "tillis" are then pasted.

**4th Stage :** For making the leaves of the flower pieces of green paper or green waste cloth are cut to the shape of the leaves and pasted properly where necessary. (See Figure 158)

In this manner a few other types of flower patterns can also be made out of groundnut shells and grass 'tillis'.

## 94. Picture out of Groundnut Shells

### *Materials required :*

1. Groundnut shells.
2. Piece of used card-board or thick paper.
3. Flour-paste.
4. Water colours.
5. Moonj "rice husk".

### *Method :*

*1st Stage :* Take a piece of chalk or pencil and draw preliminary simple drawing on the piece of card-board or thick coloured paper.

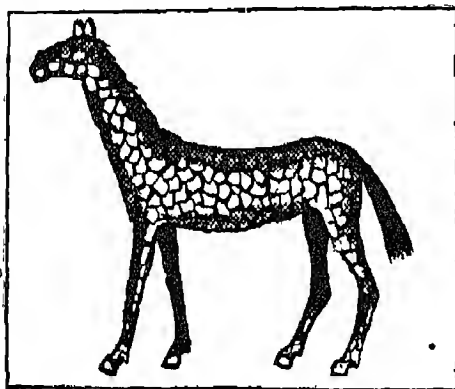


Fig. 1 9

For this type of work drawing should be bold and simple. It will be easy to take up human, animal or single bird figures rather than a group of human or animal forms. So should be the case for each choice for the selection of card-board or paper. Thick waste paper or a piece of used card-board be given preference over a thin paper as the latter is likely to give bad results due to creases of paste after drying.

*2nd Stage :* Here we shall draw the figure of a horse as shown in Figure 159.

*3rd Stage :* Apply paste after the drawing is complete and paste pieces of groundnut shells upon it.

*4th Stage :* For making the tail of the horse moonj fibre is pasted. If moonj fibre is not available then any other type of fibre can also be utilised after giving it black colour.

In this way many other original compositions can be executed by pasting groundnut shells or their pieces.





Various articles from waste



## APPENDIX A

### A TENTATIVE SYLLABUS

The articles or processes described in this book are not necessarily arranged in any scale of difficulty. Processes will be determined by the nature of articles to be prepared. The teacher in consideration of materials, tools and environments will have to decide upon the articles to be prepared. He should also see the needs of his students. He will find in Appendix II, a list of similar articles or he can himself think of something which his class may like to prepare. One thing, however, should be remembered that the articles should be as scientifically prepared as possible for the teacher to guide and children to prepare so that the articles may deserve to be called educational craft work.

The syllabus evolved here is, therefore, only tentative and may not be followed rigidly. However, a judicious teacher will select articles keeping in view the prescribed syllabus of his class. Subject to further additions and deletions combining this work with major Basic crafts to enrich the educational contents of the prescribed syllabus.

#### ARTICLES RECOMMENDED FOR GRADE I

1. Paper tree
2. Sun flower.
3. Picture from groundnut shells.
4. Article from nature craft.
5. Paper cap
6. Papier mache (1st method).

#### *Processes involved*

1. Tearing.
2. Soaking.
3. Pasting.
4. Folding
5. Modelling.

#### *Correlated knowledge involved*

1. Counting of numbers.
2. Recognising different sizes and shapes of objects.
3. Identifying names and objects from nature.
4. Composition—description of different articles.
5. Cleanliness and its importance.
6. Orderly arrangements of things.
7. Drawing of articles prepared.
8. Drawing from imagination according to the fancy of the child.

## ARTICLES RECOMMENDED FOR GRADE II

1. Bamboo cap.
2. Papier machie (1st method).
3. Marbelling.
4. Wind-mill.
5. Razai or rug.
6. Letter-holder.
7. Paper weights.
8. Bird.
9. Cloth garment.
10. Felt bag.
11. Design from tailor's cuttings.
12. Paper and cloth picture.
13. String and cord picture.
14. Skipping rod.
15. Cement paper weights.
16. Paper tray.
17. Leaf impression.
18. Mosaic picture.
19. Bel fruit.

*Processes involved*

1. Sorting.
2. Tearing.
3. Soaking.
4. Grinding.
5. Pasting.
6. Drawing.
7. Folding.
8. Scrapping.
9. Polishing.
10. Bending.
11. Colouring.
12. Modelling.
13. Washing.
14. Plating.

*Correlated knowledge involved*

1. Drawing straight lines with and without scale; drawing of parallel lines with scale.
2. Drawing of objects and colouring them; drawing from imagination and colouring.
3. Knowledge of different colours and recognising them.

4. Knowledge of polishing and names of different ingredients and articles polished with "why" and "how".
5. Importance of cleanliness and tidiness.
6. Composition—oral description of a variety of articles and writing in simple sentences
7. Knowledge of different articles prepared.
8. Direction of winds.
9. Knowledge of flowers.
10. Exercises for physical education.
11. Knowledge of a variety of leaves and trees.
12. Knowledge of tools used.
13. Decoration of the class and the school for festivals, etc.
14. Collection of leaves, flowers, stones, tin, feathers, bark, wood, etc., for making a variety of articles for the school museum.
15. Knowledge of sources of availability of materials used.
16. Development of aesthetic sense.

#### ARTICLES RECOMMENDED FOR GRADE III

1. Railway train.
2. Papier mache (2nd method).
3. Album.
4. Paper doll.
5. Flower vase.
6. Device for water.
7. Agarbatti stand.
8. Doll.
9. Coat hanger.
10. Pair of stilts.
11. Sleepers.
12. Pump washer.
13. Sewing machine belt.
14. Egg-shell doll.
15. Straw-doll.
16. Blotter.
17. Pin cushion.
18. Wire coat hanger.
19. Wire sculpture.
20. Shell tree.
21. Broken glass jars as containers.
22. Link Belt.
23. Shoulder bag.
24. Spools and coloured cloth toy.

25. Feathers fan.
26. Whistle.
27. Polish and polishing.
28. Making of ink.
29. Nature craft.

### *Processes involved*

1. Cutting.
2. Finishing.
3. Painting
4. Colouring.
5. Sewing.
6. Drilling.
7. Filing.
8. Burning
9. Modelling.
10. Twisting.
11. Washing.
12. Dyeing.
13. Painting.

### *Correlated knowledge involved*

1. Recognition of a variety of implements and their knowledge.
2. Knowledge about a variety of dyes and their uses.
3. Knowledge about a variety of processes.
4. Uses of different articles prepared.
5. Importance of self-reliance.
6. Importance of preparation of different parts of articles and their drawing.
7. Value of colours—light, medium and dark.
8. Developing aesthetic sense, orderliness at home and school.
9. Neatness and tidiness.
10. Arranging class exhibitions.
11. Composition—oral—description of variety of articles prepared, written : describing fully a variety of articles prepared—autobiography of a doll. (3) Drawing pictures of articles.
12. Importance of collection, selection and preservation.
13. Habits of a good workman in handling implements.
14. Use of compasses and other geometrical instruments for drawing different geometrical figures.

## ARTICLES RECOMMENDED FOR GRADE IV

- 1 Pen and pencil stands.
2. Papier mache (3rd method).
3. Dog
4. Clothes drying device.
5. Coat rack.
6. Balance for schools.
- 7 Book rack.
8. Simple balance.
9. Catapult.
10. Blotter.
11. Bamboo box.
12. Horse.
13. Wooden doll.
14. Ice container.
15. Razor blade pen knife.
- 16 Contrivance for spring door mat.
17. Spring door mat.
18. Signboard.
19. Drilling holes in glass.
20. Recipes for cement broken, china or glassware.
21. Batik work.
22. Shegadi.
23. Food-cover.
24. Cloth brush.
- 25 Fruit plate.
- 26 Lady's hand-bag.
27. Polish and polishing.
28. Aloe stem hat stand.
- 29 Nature craft.

*Processes involved*

- 1 Geometrical and mechanical drawings.
2. Bleaching.
- 3 Finishing.
4. Designing.
- 5 Sewing.
6. Drilling.
7. Filing.
8. Burning.
- 9 Chiselling
- 10 Sawing.

## II. Card-board boxes, cigarette packets, empty match-box and discarded envelopes :

Papier mache articles, file-rack, ration bags, wind-mill, artificial flowers and leaves, models of animals, birds and houses, trays, base for 'taklis', file-boards, card-board fans, pin cushions, wheels for toys, toys, note slips, and card-board black-boards.

## III. Bamboo

Door and window chicks, floor mats, baskets, electric-stands, spoons, butterknife, paper cutter, buttons, buckles, pen holders, map rack, towel stand, cloth hangers, oil containers, flower pots, lamp shades, takli-box, bath room rack, walking sticks, flag-post, weighing balances, furniture, picture frames, handles for implements, curtain rings, bangles, whistle, arrow and bow, aeroplane, boat, shovel, knife-case, and many other kinds of toys.

## IV. Scrap wood

Book-rack, file-rack, towel stands, map-stands, toast-rack, circular wooden mats—for the cups and kettles, weighing balance, clothes-hangers, stools, cycle stand, picture-frames, handles for axes and tools, electric-boards, flat animal and birds, and other various articles-tables, chairs, etc. foot-scale, yard measure, inkpot-stand, pen stand, hangers, geometrical models, bozes, churner, 'chakla and belna' etc. etc

## V. Miscellaneous

Broken glass containers to be cut and used as drinking pots, fish and flower pots, containers for spices, salt, etc., funnels for kerosene oil, base for electric-stands, glass powder and pieces for decoration over cement or clay models, fused bulbs for paper weights, discarded garments—of cotton, woollen, silken and other fabrics and tailors cuttings. Coloured strings, plaited mats, hooked asans, knotted curtains, and mats, plaited bells, link belts, handbags, foot covers with net cloth, door and window curtains, stitched razai, patch embroidery, cotton waste for machines, cloth ration bags, pillow-covers, tea-cosy, cloth-garlands and razai etc., etc.

## VI. Metallic waste

Wire baskets, waste paper baskets, cloth hangers, tray for drinking glasses, toast rack, plate rack, racks for cups and saucers, paper clip, pin cushions, wheels and axles for toys, home made ice-container, ends for tags, file laces, shegadi, needles out of cycle spokes, hanging and wall flower pots, flower pots, bowls, plates ash trays for shegadi, mug, string door mats, vochure holder, razor blade knife, knife out of saw blades and blotting pad, etc.

## VII Gramophone records

Fruit plates, plates for wall decoration, key name-plates, pen-rack, mats for tea-cups and kettles.



### VIII. *Rubber*

Foundations for almirahs, soles for chappals and shoes, garters, flexible strings for toys, table mats, ice-bag or hot water bag, erasing rubber for school boys, tank washers, 'haults' for doors and windows, base for electric fans or stands, insulated wrapping for good electric wire and catapult.

### IX *Leather*

Link belts, boar, and tank washers, soles for shoes and 'chappals, belt for sewing machine, money purses and bag and cover for knife-case.

## APPENDIX C

### MINIMUM TOOLS REQUIRED

Tools are necessary and, therefore, it is advisable to have at least the necessary tools which may be used both for work and for improving required tool. It is, therefore, suggested that a carpentry set should be there in every school. Crafts mentioned in this book specially for the junior classes do not require any tools. For them we need improvised instruments and tools. For instance, tools like a nail, comb or a knitting needle can easily be improvised and there is no necessity for waiting till these things are supplied by the authorities. Encouraging children to improvise tools and contrivances is itself educational. It is, therefore, suggested that only a few tools from a carpentry set will be quite enough for carrying out all the articles described in this booklet and many others which the pupils or teachers will think of.

#### A list of tools

<i>Serial No.</i>	<i>List of Tools</i>	<i>Quantity</i>	<i>Approximate Price</i>
			Rs. nP.
1.	Steel square	1	1.50
2.	Hand-saw 18"	1	6.00
3.	Tennon-saw 14"	1	10.00
4.	Wooden 2' scale	1	3.00
5.	Marking gauge	1	1.00
6.	Plane (jack-plane)	1	15.00
7.	Sharpening stone	1	3.50
8.	Divider	1	1.00
9.	Hand-drill machine with bits	1	12.00
10.	Hammer with handle 2 lbs.	1	2.00
11.	Screw Drivers, small and medium size	2	1.50
12.	Chisels firmer $\frac{1}{4}$ ", 1", $\frac{3}{4}$ ", $1\frac{1}{2}$ "	4	1.50
13.	Pliers—1 medium, 1 small	2	Medium 2.50 Small 2.00
14.	Wood files flat rough and smooth 14" each	2	6.00 for 2
15.	Triangular file 12"	1	2.50
16.	Flat files one smooth, one rough 12"	2	3.00 for 2
17.	Round file 10"	1	2.00
18.	Half-round file 10"	1	2.00
19.	Tin cutter	1	2.00
20.	A pair of pincers	1	2.50
21.	Scissors—one medium, one small with round nose and one big	3	6.00
22.	Earthen basins for dyeing	3	2.00
23.	Bucket No. 12	1	2.50
24.	Hack saw with blades	1	7.00

## APPENDIX D.

### A SELECTED BIBLIOGRAPHY

1. Arthur C. Horth. *I made it myself*. B. T. Batsford Ltd., London, 1941, 119, 8.37.
2. Bennett, C. M & Jackson C V. *Make it yourself*. John Murray, 50 Albenarte Street, London, 1956, 56, 560.
3. Bernice Wells Carlson *Make it yourself*. Abingdon Press, New York, Nashville, 1950, 153, 13.12.
4. Klenke William. *Things to Make and How to Make Them*. Vol. 1. The Manual Arts Press, Peoria, Iblinois. 1938, 63+32+32+32+32
5. Klenke William *Things to Make and How to Make Them*, Vol. 2. The Manual Aits Press, Peoria, Iblinois. 1938, 32+31+31+32+32.
6. Hennessey William J *Things for Boys and Girls to Make*. Hasper and Bios., New York, 1954, 118, 10.
7. Woolf, Arthur L. *A Book of Things a Boy Can Do*. W. Foulsham & Co. Ltd., New York, Toronto, 152, 10.00.
8. Horth A. C. 101 *Things for a Boy to Make*. B. T. Bedsford Ltd., London, 1954, 181, 6.50.
9. Browne, A. W. *The Third Book of Hundreds of Things a Boy Can Make*. W. Foulsham & Co., Ltd. London, 125, 9.75
10. Lillie B. & Arthur C. Horth. 101 *Things for Girls to Do*. B. T. Batsford, Ltd., London, 1954, 175, 6.75.
11. Browne, A. W. *The Third Book of Hundreds of Things a Girl Can Make*. W. Foulsham & Co., Ltd., London, 134, 9.75.
12. *The Second Book of Huidreds of Things a Girl Can Make*. W. Foulsham & Co., Ltd. London, 159, 9.75.
13. Leslie, S. Wollard, *The Girl's Handicraft Book*. Ward, Lock & Co. Ltd., London, 1956, 228, 12.00.
14. *Hundreds of Things a Girl Can Make*. W. Foulsham & Co. Ltd., London, 160, 9.75.
15. Hughes, F. Clarke. *Amaten Handicraft*. The Bruch Publishing Co., Milwaukee, 1952, 127, 12.50.
16. Doris Cox & Barbara Warren. *Creative Hands*. John Wiley & Sons, New York, 1956, 380, 33.00.

17. Madden, Ira C. *Creative Handicraft*. The Goodheart Will-Cos, & Co., Inc., Chicago. 1955, 224.
18. Hamilton, Edwin T. *Handicrafts for Girls*, Dodd, Fead & Co., New York, 1957, 270.
19. Jaeger Ellsworth. *Nature Craft*. McMillen & Co , New York, 1956, 128, 10.00.
20. Jaeger Ellsworth. *Easy Crafts*, McMillan & Co., New York, 1956, 129, 10.00.
21. Schwallack James, *Fun-time Crafts*. Children's Press, Chicago, 1949.
22. Parkhill Martha & Spaeth Dorothy. *It's Fun to Make Things*. The Ronald Press Co., New York, 1941, 177, 14.25.
23. Leeming Joseph. *Fun with Wire*. J. B. Lippincott. Company, Philadelphia & New York, 1955, 96, 14.25.
24. Leeming Joseph. *Fun with Fabrics*. J. B Lippincott Co., Philadelphia & New York, 1950, 96.
25. Rozeaman, I.P., *Leather Craft*. The Dryad Press, London.
26. Haines, Ray E. *The Home Craft Handbook*. D. Van Nostrand Co., Inc. Princeton. 1948, 1008, 32.00.
27. Ickis Manguerite, *Handicrafts & Hobbies for Pleasure & Profit*. Greystone Press, New York, 310, 19 00.
28. Norbeck Oscar E. *Book of Indian Life Crafts*. Association Press, New York, 1958, 253, 27.50.
29. Roberts, C. C. *Real Book About Real Crafts* Garden City Books, Garden City, New York, 1954, 223, 9.50.
30. Zarchy Harry. *Creative Hobbies*. Alfred A. Knoff, New York, 1953, 299+5, 18.25.
31. Wagner Glenn A. *Hobby Craft for Everybody*. Dodd, Mead and Co., New York, 1954, 96, 15.00.
32. Wagner Glenn A. *The Book of Hobby Craft*. Dodd, Mead and Co., New York, 1952, 95, 15.00.
33. Newkirk L. V. & Sutter Lavada. *Crafts for Everyone*. D. Van Nostrand C., Inc. Princeton, 1950, 210.
34. National Institute of Basic Education, New Delhi 14 : *Fibre Craft*, 1959.

